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The Physiotherapy Review

Volume 16 Number 4

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The Physiotherapy Review

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The Chronically Ill Patient and Physical Therapy

Frances Baker, M. D.

Day after day in a large clinic or in private practice, we see patients who have been treated for a long time for varied ills. They either are discouraged or have reached the point of enjoying and discussing ill health and the number of doctors that have tried to diagnose their cases. They are the ones whom we so often dread to see because of our own inadequacy in dealing with their troubles, and yet perhaps they are the very ones who most need our help. In our special fields, we all have numbers of chronic patients whom we are trying to improve or relieve. Whether we are interested in the brain and nervous system, in muscles, in bones and joints, in eye, ear, nose, or throat, in chest, in abdomen or in pelvis, and whether the etiology is attributed to infection, malignancy, endocrine disturbance, degenerative process, developmental failure or any one of many other causes, there remain many patients who fail to be relieved of their symptoms. The difficulties met with in obtaining relief have caused these persons to seek help at spas, baths, and springs, or from various non-medical groups. It is only as we realize our own inadequacy and take a greater interest in these patients, that we can hope to care properly for them. To administer worth while care requires the complete armamentarium of the medical profession,—medicine, surgery, psychiatry, x-ray and physical therapy. Recognized medicine is old. Surgery belonged to the barbers until the nineteenth century. Modern medicine and surgery began in the middle of the nineteenth century following great scientific discoveries, the microscope, for example, being essential to Pasteur in his discovery of living organisms as the cause of infectious diseases, and this in turn making possible Lister's recognition of the ncessity for asepsis in the operating room. Although we still have great epidemics, rapid strides have been made in the study of infectious diseases and control is being achieved even though the etiology of many of these diseases has not been discovered. The tremendous improvement in public health has been astounding in the prevention of the spread of infection through control of contacts,—water, milk, and food supplies. Departments of Health have been active in protecting workers against industrial hazards. Industrial insurance, mal-practice suits, and x-ray have decreased the number of patients handicapped by fracture deformities. We are learning more about mental diseases, malignancy, endocrinology, circulatory diseases, body chemistry and the like, but we are still faced with the fact that patients remain chronically ill. These patients may be placed into two great groups:

1. Those who have actual demonstrable pathologic changes.
2. Those who have no demonstrable pathologic changes.

In the first group, those with demonstrable lesions, are the patients with cardiovascular disease, respiratory disorders, such as chronic bronchitis and asthma, gastro-intestinal conditions, such as ulcer or gall bladder disease, paralyses, arthritis and many other maladies, who have responded indifferently to prescribed medical or surgical treatment. In the second group are those who are always tired, who have vague pains which unfit them for their jobs, and who feel themselves to be and actually are inadequately equipped both in mental and in physical make-up to cope with the life thrust upon them.

If we wish to have any real understanding of the physiology of the body we must have basic information concerning the development of the erect posture and of the effects of civilization upon the human body. Certainly we cannot handle the chronic patient without considering first, the effects of the upright posture, and secondly, the effects of civilization with its nervous strain arising from competition both professional and economic, rapid transportation, crowding in cities, artificial diets, and industrial requirements and hazards. In order to know anything about the effect that development of the erect posture may have upon health we must review the evolutionary phases and consider the time that has been required to bring about the plantigrade posture and the visceral and physiological adjustments that had to be made because of this change in position. Sir Arthur Kieth said, "Man's gait and posture are the culmination of a series of evolutionary phases which are to be traced in bodies of orthograde primates throughout the greater part of the tertiary duration of the earth's history." If we study the genealogical tree (Figure I) we note that monkeys, small orthograde primates represented by the gibbon, large orthograde primates including the great anthropoids, and man all arise from a common stem. The evolution of man's posture is divided into three stages: (1) The Hylobation or Gibbon State, (2) The Traglodytian or Great Anthropoid Stage, (3) The Plantigral Stage. These stages represent great structural revolutions apparently starting early in the Oligocene period. They do not indicate that man originated from gibbon or Anthropoid but rather that man's evolution carried him through stages reached by gibbons and by anthropoids, and that the third stage carried him on to the present period. The migration of muscles, changes in viscera, nerves, vessels, etc., are the result of a developmental

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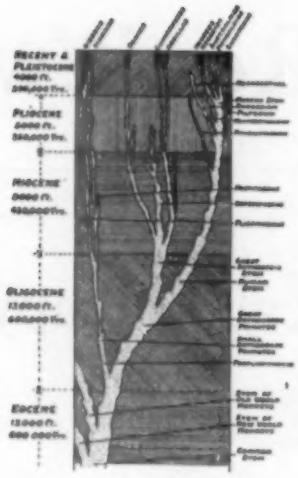

Fig. 1

Fig. 2

process not yet understood, a growth mechanism probably hormonal in origin. To the evolutionary stage from which the gibbon originated we owe the chief of our postural modifications (Figure II). We see the development of the erect trunk occurring somewhat as follows:

1. In order to support the trunk upon the pelvis, the loins had to shorten so as to increase their stability by decreasing the leverage necessary to pronograde monkeys for leaping. This required sacralization of the seventh lumbar vertebra and this in turn meant that all the elements lying in the same embryonic segment. nerves, vessels, and muscles, had to shift; that the buds forming the lower limbs and the nerve centers of the spinal cord had to move forward. The pelvis had to broaden to give greater attachment for the hypertrophying muscles, and further muscular power was added with the disappearance of the tail and the attachment of its erector muscles to the sacrum.

2. The thorax became transformed and this transformation was for purposes of posture and not respiration. There are three costal segments, the dorsal, to which the spinal muscles are attached and which became so increased in length as to reach the level of the vertebral spines; the lateral segment for the attachment of the intercostal and oblique abdominal muscles; and the ventral segment for the attachment of the rectus abdominus muscle. Since the gibbon uses his forelimbs to catch the branches of trees and to support and transport his body, the thorax became compressed between the pectoral group of muscles anteriorly and the trapezius, rhomboid, and latissimus dorsi posteriorly. The pectoralis major then took origin not only from the sternum but from the clavicle and ribs as well. The sternum became flattened and united due to the greater stress of the pectoralis muscle upon it as the arms supported the body. The latissimus dorsi kept its origin from the spinous processes of the vertebrae and added a fascial origin from the iliac crest and a muscular origin from the third or fourth lower rib on either side. The serratus magnus muscle increased the lateral convexity of the ribs and so increased the lateral diameter of the chest. The shoulders were drawn outward and backward to form the broad shouldered figure of all orthograde primates.

Fig. 3

The straight abdominal muscles which are attached to the whole length of the sternum and first ribs in the pronograde monkeys came to attach themselves with the oblique muscles, to the fifth, sixth, and seventh costal cartilages. The diaphragm which is oblique in the pronogrades, obtained its central tendon in the gibbon, the domes became nearly horizontal and the crucial fibres shifted over the sheaths of the psoas and quadratus lumborum muscles. Instead of the apex of the heart merely touching the diaphagm, heart and diaphragm became more closely bound in the gibbon and the azygos lobe of the right lung and of the subcardiac sinus became compressed. This binding down of the heart to the diaphragm resulted from the increased development of the apical region of the lungs since this part of the lung can only be aerated if the roots of the lungs take part in the respiratory movements of the diaphragm. Later, in the anthropoids, we see the central tendon of the diaphragm become fixed to the roots of the lungs through the pericardium. Many other changes, which we need not consider here, occurred in the thorax at this time secondary to orthograde posture.

In like manner, changes occurred in the abdominal cavity. Peritoneal adhesions developed to hold organs in their correct positions. The spleen, the cardiac and pyloric ends of the stomach, the duodenum, and the colic flexures became sealed into place. Here again we see the results of a growth substance probably inherent in the embryonic cells. The abdominal musculature, though really the antagonist of the diaphragm, was forced to take up the support of the viscera and, with the shortening of the loins and the evolution toward the plantigrade or human position, the intra-abdominal pressure increased and the compression of the abdominal viscera reached its highest point. So the abdominal muscles took on the increasing burden of supporting the organs while they still had to move downward with the thrust of the diaphragm in respiration.

The second great evolutionary phase is represented by the great anthropoids (Figure I). This stage probably evolved at the end of the Oligocene or beginning of the Miocene period some two or three million years ago, and, from a progenitor similar to the surviving great anthropoids, orang-outang, chimpanzee and gorilla, man has developed. (Figures 3 and 4.) We see a great increase in weight probably resulting from glandular changes and this weight forced the anthropoids to a more nearly terrestrial habitation. We see the tremendous development of the

Fig. 4

musculature chest and shoulders required to support the increased weight upon the arms. The fifth and sixth, and sixth and seventh costal cartilages became articulated by downgrowing heels so that the power of the diaphragm became extended from the lower six ribs, to which it is attached through these articulations, to the sternum, which could then be raised in pure thoracic breathing. The first pair of ribs and manubrium became more closely bound to act as a single functional structure which moves as a whole with thoracic breathing. The heart became still more firmly bound to the diaphragm and, through the pericardium, the diaphragm was bound to the roots of the lungs. These modifications caused development of the apices of the lungs as thoracic breathing increased. The loins were shortened still more by sacralization of the lumbar vertebrae. The gibbon has six lumbar vertebrae, gorilla and orang-outang have only four while the chimpanzee and man have five. The expanding musculature necessary for the support of the trunk caused the continued broadening of the iliac crests so that the pelvis and sacrum presented still greater areas for muscle attachment.

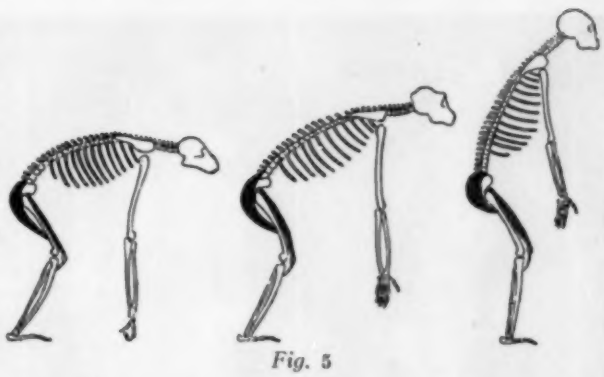

Fig. 5

The third or Plantigrade Stage probably originated at the beginning of the Miocene or late in the Oligocene period (Figure I), when the line leading to man branched off from the anthropoid stock, and the plantigrade posture evolved. In this stage structural changes were confined almost entirely to the lower extremities. The knees and thighs became more extended and straightened until the lower limbs came to appear as if they were a downward continuation of the trunk. (Fig. V.) Then the pelvis or fulcrum of the lower limbs and the spinal column had to be modified. (Figure VI.) The pelvis tilted downward anteriorly and the lumbar curve followed it, in turn demanding compensatory dorsal and cervical curves. With the extension of knee and hip, the foot was transformed. (Figure VII.)

In gibbon and anthropoids the weight of the body is only momentarily transferred through the lumbar region to the lower limbs, whereas in man this is constant. So man needs an increasing lever and, to gain this, the tendency is for sacralization to extend cauded again rather than cephalad as in the orthograde primates, both gibbon and anthropoid. Still greater increase in the sacrum and in the spread of the iliac crests was needed for the broad attachments of the musculature of the hip and trunk required to support the upright posture. To obtain lateral balance the ribs had to be further modified to give sufficient attachment to the far heavier quadratus lumborum muscles and to the great abdominal muscles.

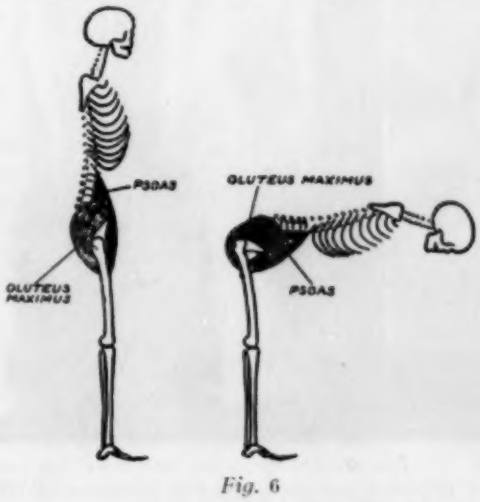

Fig. 6

The fossil remains (Figure I) of early man, Pithecanthropus erectus and Neanderthal man represented by the fossils of Heidelburg and Piltdown, indicate that the lower limbs took on their present form very early, the femur of Pithecanthropus erectus being little different from that of man today, but the balancing of the head upon the neck is more recent in development and occurred after the beginning of the Pleistocene period. The shoulders and arms are suspended from the cervical and upper dorsal region of the spine largely by the trapezius and by the rhomboid and serratus sheets of muscle. These were of course already present in the anthropoid stage, but the reflex postural mechanism which forces the trunk to sustain the weight of the shoulders and arms rather than the arms to suspend the weight of the trunk as in arboreal life, developed late and is a characteristic of man. With the evolution of the erect position, reflex postural mechanisms had to develop in order to maintain it. These must be controlled by nerve centers. Centers in the spinal cord, mid and hind brains of the monkey are organized to carry out reflexes for the pronograde posture, and, as monkeys habitually assume an erect posture when resting, there must be a nucleus to carry out this reflex. It is probable that this nucleus has enlarged in anthropoids and in man. The efferent stimuli to the abdominal muscles are probably set in motion by stimuli arising from sensory terminals, Pacinian-like corpuscles in the mesentery. As already mentioned, a new reflex had to be set up to maintain the posture of head and shoulders. In the foot, the maintenance of the arch is dependent upon the action of the tibialis muscles, a use found only in man, requiring the development of another new reflex mechanism. All other primates are really endowed with four hands and it was the development of a true foot that gave man the opportunity to gain his remarkable manual dexterity.

Hand in hand with the evolution of the upright posture goes the increase in the size of the brain and the great increase in intellectual powers. Even early man did not posses the prefrontal brain, which is another characteristic of late development.

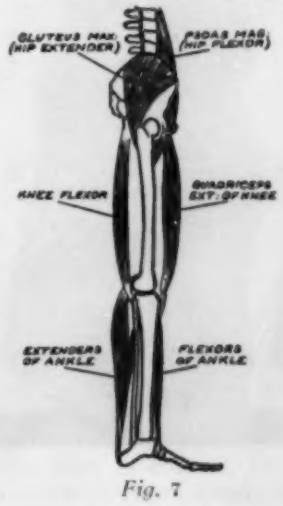

Fig. 7

If we think of those acquisitions belonging to man alone: the superior intelligence with the marked increase in the size of the brain; the plantigrade posture and gait; the supported shoulders and head, we must realize how various factors can strike at these newest attainments and hence our most vulnerable spots, to cause serious upsets or disaster

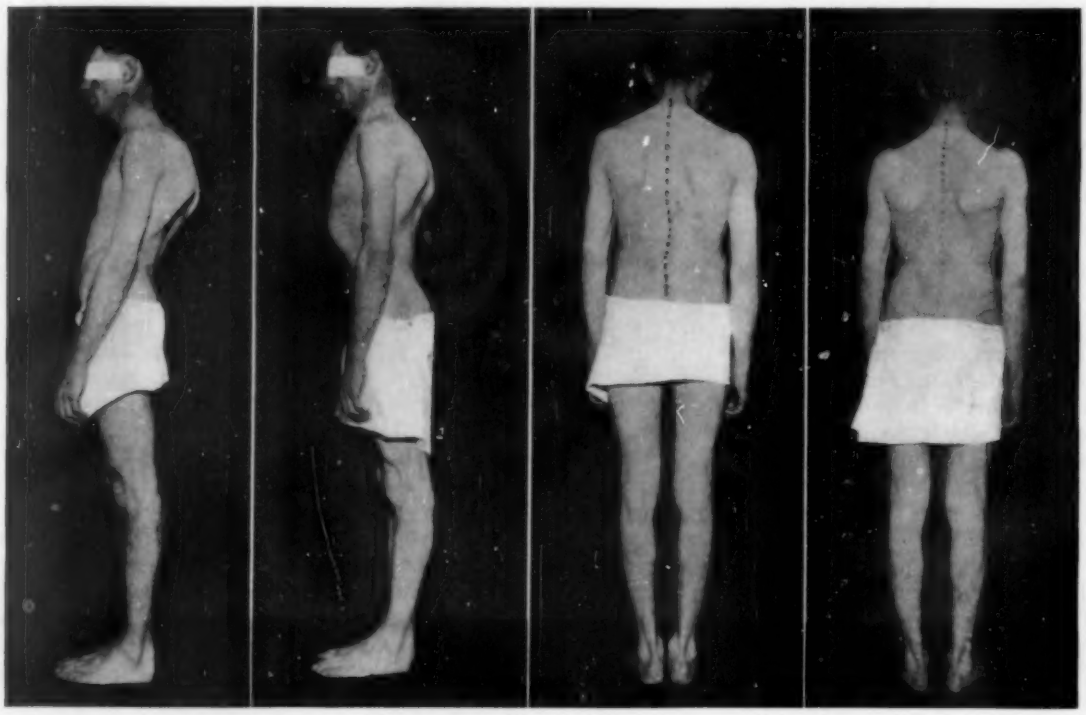

Fig. 8
Case I. The poor coordination of muscles frequently seen and resulting in symptoms referrable to poor body mechanics.

both mentally and physically. We must remember, too, that some human types have already become extinct; that the present human race consists of at least four distinct types some of which also may disappear, since we recognize the theory of survival of the fittest and see evidences of it in world politics today. Seeing the various types of individuals among our own European race and the definite upsets from normal caused by certain growth factors in endocrine substances with which we are already familiar, we recognize shifts in the physiology of the body even in a limited group. We have become what we are because of growth substances within the tissues of the body and not because of inherited anatomical changes.

The intelligence with which man is endowed has given him power to build a civilization. Sciences have developed, and have taken direction frequently from single individuals. We accept the new inventions which make physical life easier but more dangerous and nervous strain tremendous. Business competition decreases

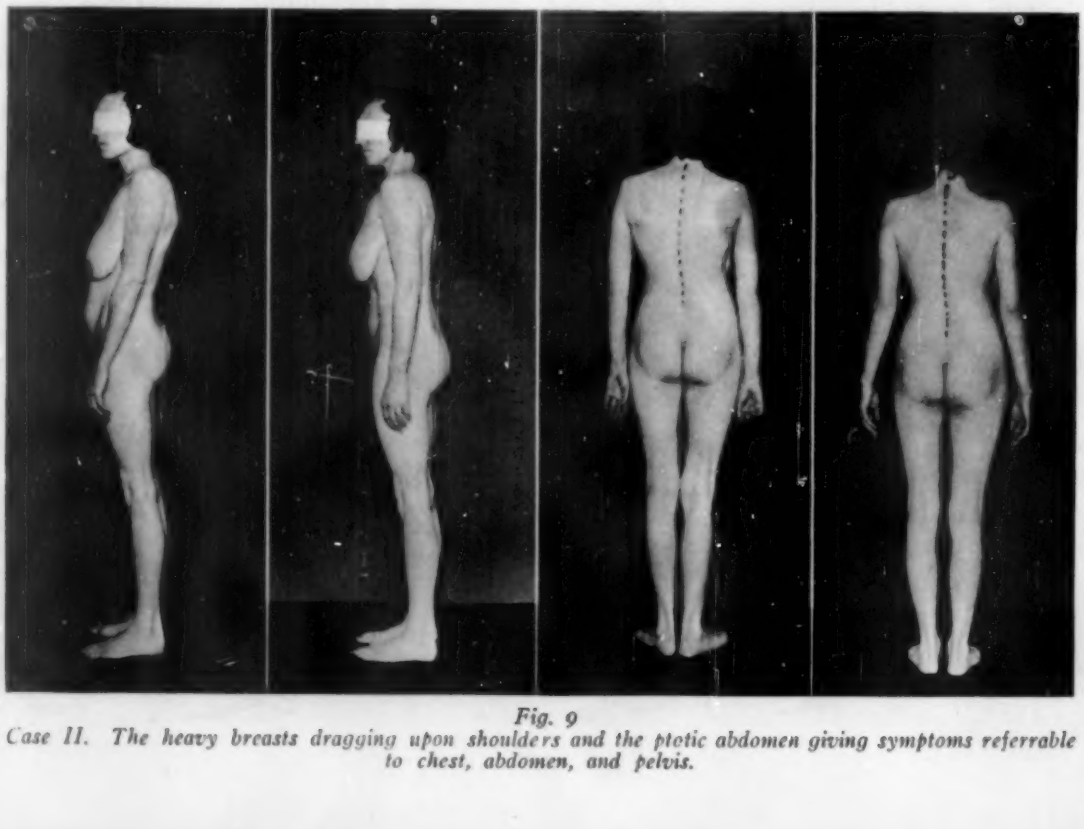

Fig. 9
Case II. The heavy breasts dragging upon shoulders and the ptotic abdomen giving symptoms referrable to chest, abdomen, and pelvis.

physical activity and increases nervous strain. We measure each person economically and professionally and those who cannot compete, belong to the unfit. The increasing success in preserving the physically handicapped, and the scientific protection and treatment of the weak, has lengthened the life span but has enlarged the number of chronic patients.

With these facts in mind what lines of attack should we follow in order to improve the health of these patients? Sir Colin MacKenzie says, "If we exclude specific infectious diseases, which are in the main preventable and due to segregation, we may define health as a correlation of all the bodily systems to the erect posture, and ill health as a failure of one or more systems to correlate to it." Though this is a very broad statement it is to a very large degree true and gives us a basic plan for the management of the patient. Dr. Joel Goldthwait was one of the first clinicians to recognize the relationship between the erect posture and health and to insist systematically on the correction of body mechanics as an important part of the treatment of chronic disease. He looks upon the diaphragm as the key organ to proper aeration of the lungs and to normal circulation. If we remember that the heart is bound to the diaphragm and that, through the pericardium, the diaphragm is bound to the lungs; that the diaphragm is attached to the six lower ribs and that articular heels between the fifth and sixth and the sixth and seventh ribs developed to bind the diaphragm to the sternum so that it can be lifted in thoracic breathing, and that these are purely evolutionary acquisitions of the erect individual, we must recognize the importance of placing the diaphragm in its most advantageous working position. This means good mechanical alignment in posture. Since aeration of the apical lung occurred with these modifications and since it can only be maintained when the diaphragm is acting normally, the apices are often poorly aerated. We know that tuberculosis, for instance, is most likely to involve apices first.

Inasmuch as the abdominal muscles had to take on the job of supporting the viscera in addition to opposing the diaphragm, a thoracic sag must be followed by a ptotic abdomen. As we grow older there is a tendency for the shoulders to drop forward and downward and so pull upon the brachial plexus and cause neuritic pain. Development of the legs is far greater in man than in any of the primates and requires a far greater supply of blood which must be returned to the heart under pressure great enough to support the vertical column. Dr. Goldthwait goes so far as to say that the stasis caused by failure of correct diaphragmatic action may be to a large measure responsible for such circulatory disturbances as arteriosclerosis, Raynaud's Disease, Buerger's Disease, varicosities, and hemorrhoids and that such stasis may even be responsible for certain cases of diabetes, for dysmennorrhea, colitis, etc. Whether we wish to believe that poor body mechanics is entirely responsible for such conditions, or whether certain tissues of the body are of poorer quality than others and so fail to correlate with the erect posture we shall all agree that maintaining the body in the best mechanical alignment is a necessary part of treatment.

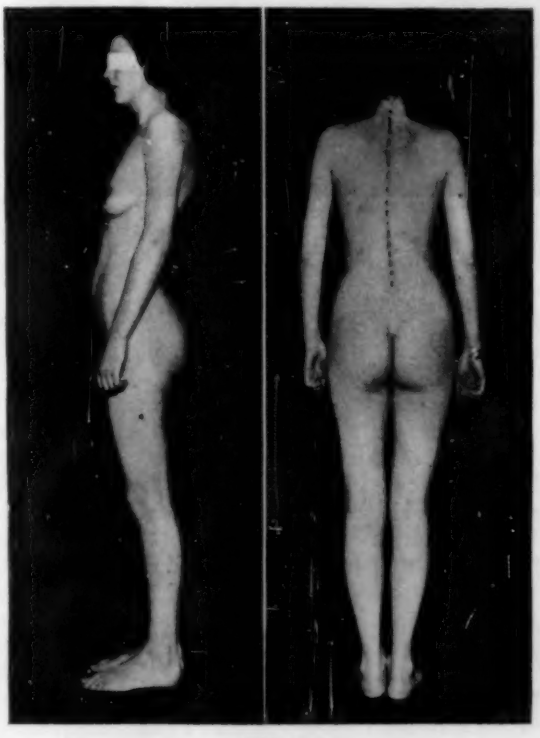

Fig. 10

Case III. The tall, slender patient who finds adjustment to the erect position difficult and who frequently has many vague symptoms.

Fig. 11

Case IV. The poor bodily alignment, the arthritis, the varicose veins, the digestive disturbances, and nervousness may be attributable to maladjustment to the erect posture.

Dr. John Berton Carnett, late Professor of Surgery at the University of Pennsylvania, was impressed with the number of abdominal incisions that many patients presented without having gained relief from their symptoms. He soon recognized that the pain was in the abdominal wall rather than in the peritoneal cavity and that it was radicular in type and could be relieved by correction of the mechanics of the body.

Dr. William D. Stroud, Professor of Cardiology at the University of Pennsylvania has been most active in

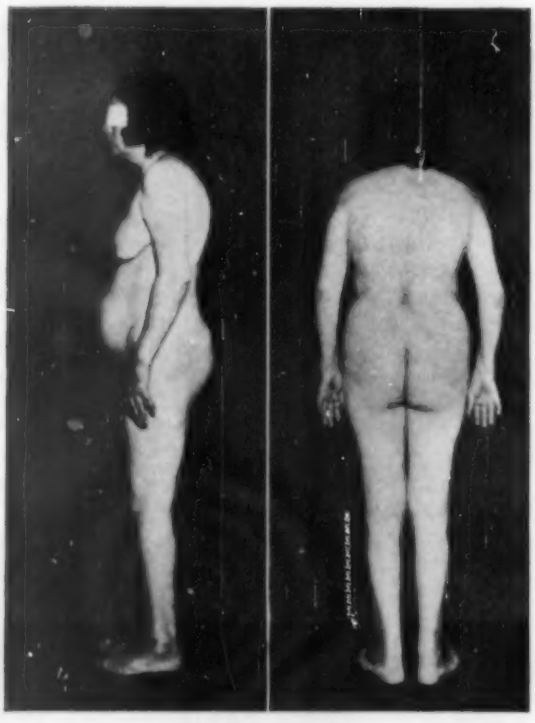

Fig. 12
Case V. Illustrating general ptosis and poor peripheral circulation.

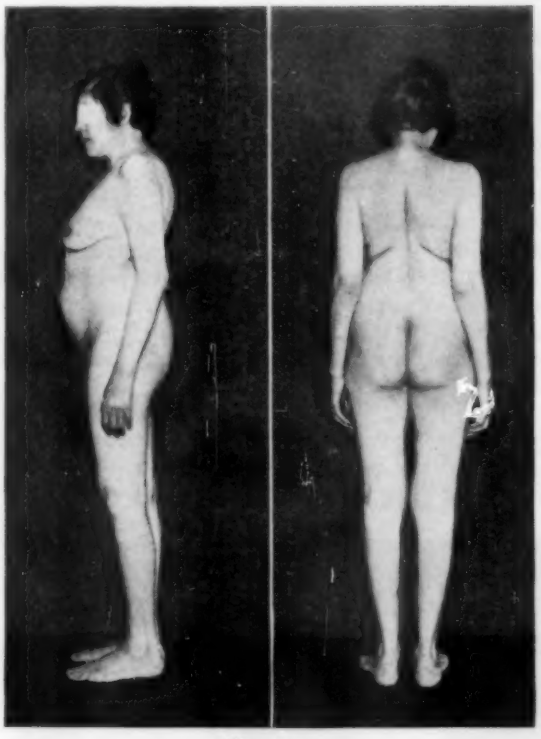

Fig. 13
Case VI. Illustrating general ptosis in a patient with rheumatoid arthritis.

emphasizing the importance of proper exercise and rest for patients with heart disease, gradually working toward a rehabilitation sufficient to place them into well chosen types of employment.

Dr. Edmund Jacobson of the University of Chicago, on the other hand, became interested in the person suffering from great nervous strain, the business man, and the socially maladjusted, and made himself proficient in medicine, psychiatry, mathematics, aand physics that he might study the relaxation of muscle. He then endeavored to train his patients to relax their own muscles that they might obtain rest and withstand the nervous strain to which they were constantly subjected.

We can hardly fail to note that every one of these clinicians, whatever his basic methods may be, is aiming to make the patient dependent, not upon the doctor, but upon himself alone.

The case reports illustrate chronic conditions that we see frequently in daily practice.

Case I. J. B. B., male, 52 years of age (Figure 8), entered the hospital on October 22, 1934, complaining of blinding headache and blurring vision. Glasses and drainage of the sinsuses gave no relief. The patient was discharged and four weeks later at 2:30 a. m. developed a severe low backache relieved by the knee-chest position. Examination revealed a man looking much older than his age with indurated seminal vesicles, varicose veins and the very poor posture and poor muscular coordination that the photograph reveals. This patient's hemoglobin was 104 per cent, and the red blood cell count was 5,900,000. In patients with bad body mechanics we often find a high hemoglobin and red blood cell count. X-ray examinations of the lumbo sacral joint revealed definite narrowing of the fifth lumbar pedicles and facets attributable to the wear and tear of position. He reported for physical therapy on October 29, 1934, and received heat, massage, and postural training which was continued until December 13. He was entirely free of symptoms but his muscular control remained poor. He returned to his work as a motorman on January 4, 1935, and has had no return of pain.

Case II. H. L., female, 31 years of age (Figure 9), reported to the out-patient department on September 3, 1934, because of edema of the ankles and orthopnaea. She had had rheumatic fever at the age of 14. Examination revealed evidence of rheumatic heart disease and she was given digitalis. On November 18, 1934, she again reported because of pain in the left side of the chest, anteriorly and posteriorly, and tenderness in the right upper and lower quadrants of the abdomen. She gave a history of having had the Fallopian tubes removed in 1932 for suspected hydrosalpinx. Examination revealed no abdominal masses but the uterus was limited in motion because of a tight utero-sacral ligament. There was definite cutaneous hyperesthesia over the chest. X-ray examinations of the spine were normal. She reported to the physical therapy department on October 25, 1934, and was treated with postural and lateral trunk-stretching exercises. She was discharged on November 19, free from pain with a plan to be followed at home.

Case III. C. R., female, 31 years of age (Figure 10), first entered the out-patient department in May, 1932, complaining of pain four hours after eating. She had no food indiosyncrasies, nausea, or vomiting. She was constipated. These symptoms persisted in spite of dietary control. There was a question of peptic ulcer at one time and chronic cholecystitis at another. In January, 1932, she came in complaining of low backache. In March, 1934, she was complaining of irregular menstruation. She reported throughout that year and was treated with hot douches and sitz baths. In February, 1935, she returned because of backache in the morning. She reported to physical therapy on March 18, 1935, and was last seen there July 15, 1935, having had only seven periods of posture training. She reported for examination on August 26, saying that she was having no pain

or discomfort.

Case IV. J. T., male, 51 years of age (Figure 11), first reported to the clinic in August, 1932, complaining of low back pain of one year's duration. His appetite was poor; he was nervous; he had developed rheumatoid arthritis in the hands; he had marked varicose veins. He was unable to work and belonged to that group which we consider generally inadequate. He was placed on a special diet high in vitamins, given sedatives, and treated in the physical therapy department with heat, histamine ionization, massage, and exercise. This man represented very well the type whose systems are unable to correlate themselves to the erect posture.

Case V. M. M., female, 40 years of age (Figure 12), first reported to the outpatient department on September 24, 1931, because of an arthritis of 22 days duration. She had a blood pressure of 90/56 and the blood Wassermann test showed a three-plus reaction. Physical therapy, consisting of heat, was begun in October, 1931, and continued until July, 1932. She entered the hospital July 21, 1932, complaining of abdominal distension and remained until August 6. She reported to the Arthritis Clinic in July, 1935, and was treated in the physical therapy department from then until December, 1935, with only moderate relief. Aside from the general ptosis of the organs it was noted that she had very poor circulation to the feet.

Case VI. M. J., female, 45 years of age (Figure 13), reported to the out-patient department on October 16, 1935, stating that her hands had become swollen four years previously, but at that time she had weighed 180 pounds while her present weight was 132 as a result of rheumatoid arthritis. She reported to the physical therapy department for general heat, massage, and exercise from October 16, 1935, to May 5, 1936. She had already returned to routine work, gardening, and so forth and was feeling very well indeed before treatments were discontinued. Her posture improved to a slight degree.

Case VII. I. H., female, 40 years of age (Figure 14), reported to the out-patient department in August, 1928. She had been comparatively well until January, 1928, when her husband left her. She had 2 children whom she had to support and she began work in a department store. Her first complaint was constipation. On October 28, she came in because of weak eyes. In August, 1930, she was complaining of pain in the back and nervousness, inability to sleep, and poor appetite. She was given sodium bromide. In February, 1931, she reported to the Women's clinic complaining of backache and leukorrhea. There was tenderness in the right fornix and a mass was felt. She was treated for this until June, 1933, when she entered the hospital for cervical resection, suspension of the ovaries, appendectomy, and repair of a diastasis recti. As she received no remarkable relief, x-ray examinations of the back were made in August, 1933, and a sacrilized fifth lumbar vertebra was found. She was given an orthopedic corset for support and was transferred to the physical therapy department. She was relieved to a certain extent but in April, 1934, was extremely tired, exhausted and complained of nagging pain. Arrangements were made to send her to a quiet place for a vacation and she returned feeling much better. She was very well during the next year, went to the Y. W. C. A. for dancing classes and her mental attitude was improved. She failed to go on a vacation in 1935 and was again tired and exhausted. Another rest period was arranged and in the Spring of 1936 she was again feeling very well. She was able to handle her home but the added burden of supporting her children and managing all family affairs was too great and she had to be given a recreational and social plan of adjustment which was far more important than treatment of her multiple complaints.

Case VIII. H. de N., male, 46 years of age (Figure 15), reported to the out-patient department on April 27, 1936, complaining of general weakness. This patient is a mining engineer but has been unable to work since 1927. He was confined to a State Institution, according to his wife, because of nervousness and because of periods of ungovernable rage. On the whole he is happy and has a keen sense of humor but has outbursts which are beyond his control. He was very unhappy at the State

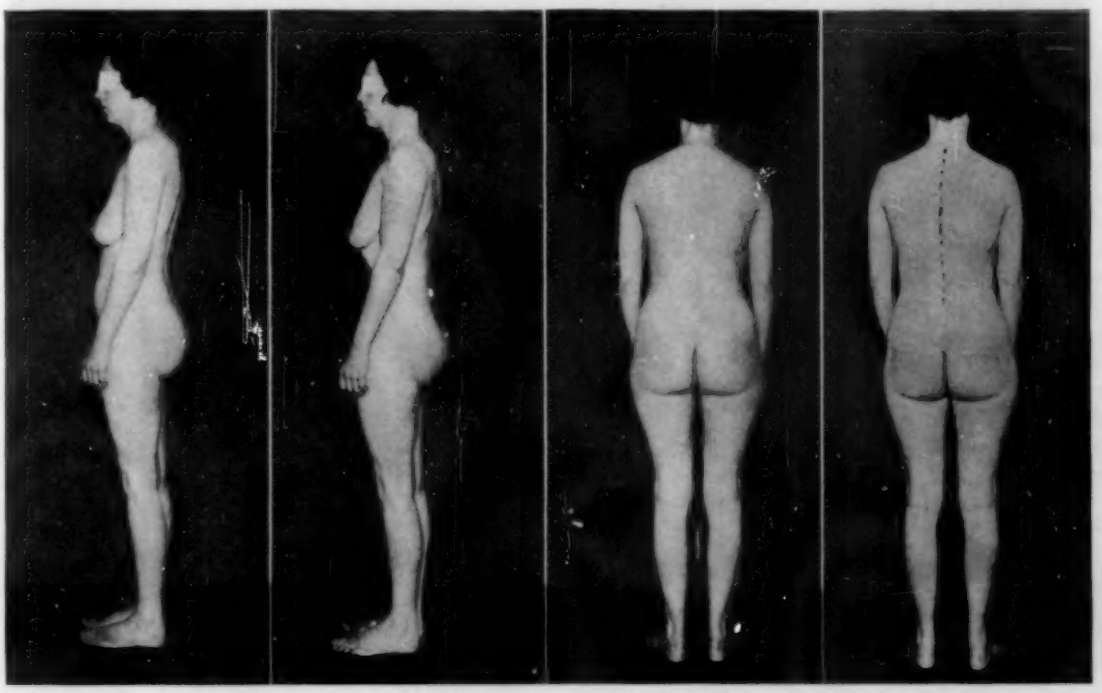

Fig. 14

Case VII. This patient's inability to cope with her problems are expressed in her face and general carriage.

Institution and his wife felt that it was better that he be at home. His general examination was negative except for his very poor posture. He complained of difficulties in eating. He said that his shoulders had always been round but that he remembered no backache of any kind. His hemoglobin was 106 per cent and his red blood cell count was 5,240,000. He was placed on a program of postural training, breathing and relaxation. He is, however, unable to cope with economic conditions as he has to meet them. We can assist him physically but improvement in mental adjustment is very doubtful.

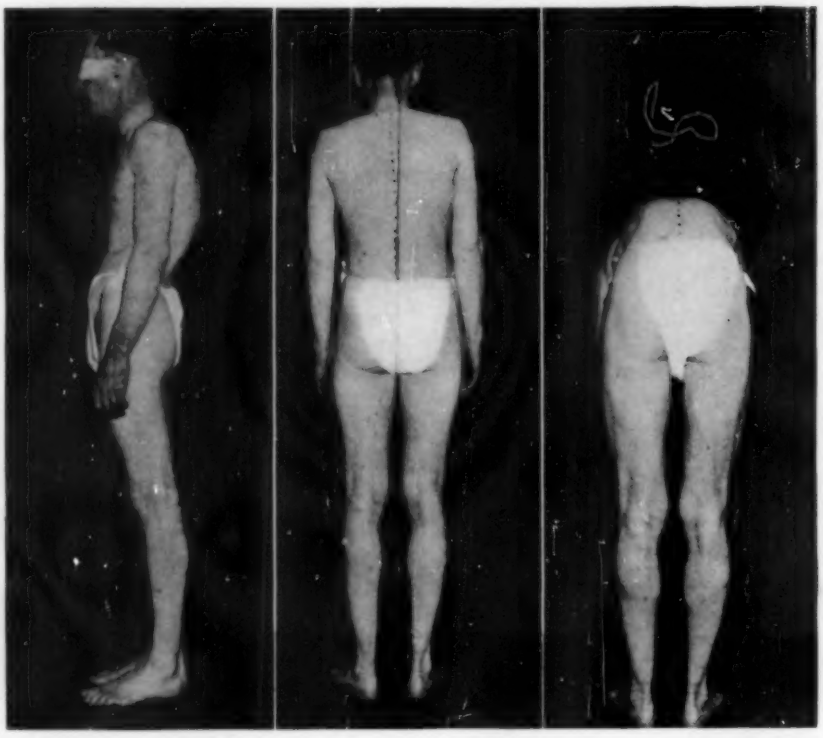

Fig. 15

Case VIII. This patient is unable to meet economic requirements, either mentally or physically.

Case IX. M. S., female, 40 years of age (Figure 16), reported on January 30, 1935, having just been discharged from a State Hospital, where she had been treated for alcoholism. She had had an oophorectomy and salpingectomy in 1915; in 1927 she had a uterine suspension; in 1928 an ovarian cyst was removed. She had been suffering from low backaches since 1915. Her examination showed marked limitation in motion of the lumbar spine in all directions with tenderness over the third, fourth, and fifth lumbar vertebrae. Hyperextension of the spine caused pain in the region of the fourth and fifth lumbar and first sacral vertebrae. X-ray examinations showed narrowing of the disk between the fifth lumbar and first sacral vertebrae, suggestive of a congenital anomaly. She was fitted with a corset in February and was transferred to the physical therapy department in March. She reported to Medical Clinic in April complaining of weakness, loss of strength, fatigue, coldness, constipation, and a feeling of abdominal fullness. There was a questionable mass in the area of the sigmoid. Proctological examination revealed hemorroids and a sharp rectosigmoid kink. Barium enema revealed no lesions. She was put on a regime for constipation, including min-

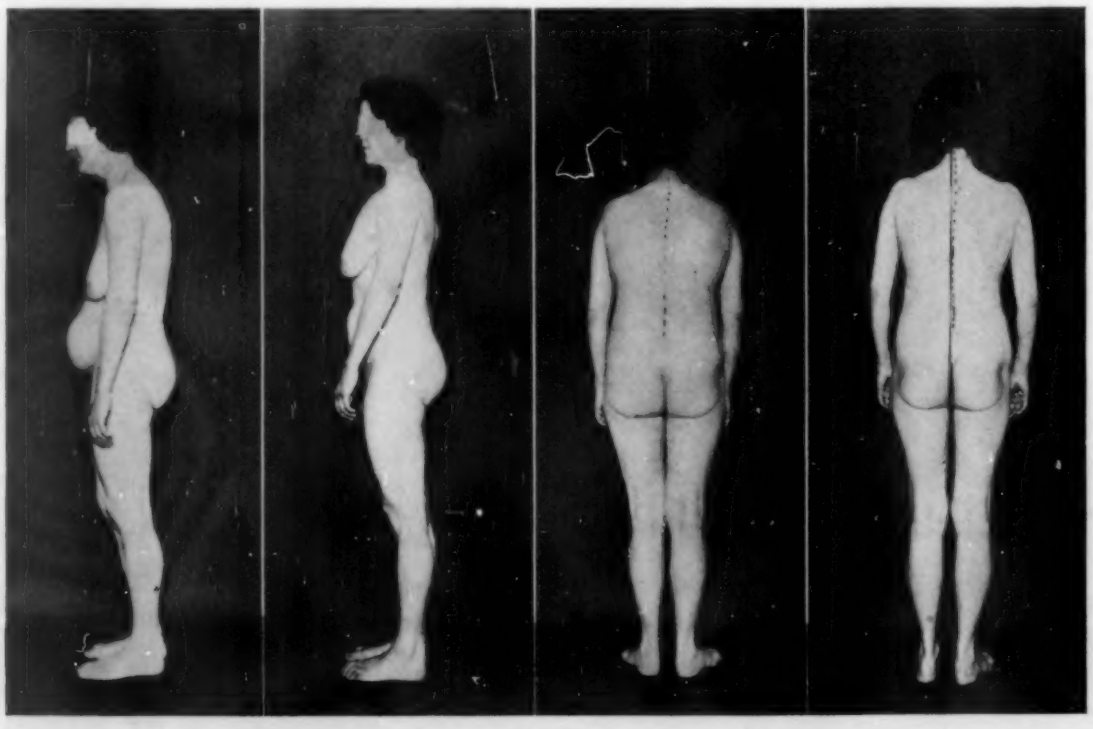

Fig. 16

Case IX. This patient had been released from a state hospital where she had been treated for alcoholism. Note change in expression and posture.

eral oil, and olive oil enemas. When seen in May she still complained of fatigue and of requiring long hours of sleep. She was able to obtain a better home situation in June and felt much better. The improvement both in posture and in facial expression is worthy of note.

If we bear in mind first, how, when, and where man came by his erect attitude, remembering what its newest developments are; and secondly, that the wear and tear of present day civilization upon the body both nervously and physically is very great, we, as physical therapists, will have something of value to offer any patient who comes before us. This will apply whether he is referred for rehabilitation following cardiac decompensation, whether he has bronchial asthma with the reversed breathing so often seen, whether he is crippled with deforming arthritis, or whether he is nervously unstable and socially maladjusted.

Our treatment must have certain definite aims. We must so educate the patient first, that he will be able to obtain restoration of mechanical alignment of the body and physiological readjustment of the systems; secondly, that he will be able to relax both mentally and physically; and thirdly, that he will become dependent upon himself both physically and economically by making the necessary readjustments. To accomplish such aims as these, we must inspire sufficient confidence and trust in our patient so that he will be interested enough to devote the time and attention necessary for so extensive a process of rehabilitation.

We have many devices at our disposal to assist us in this program: electrical currents for stimulating muscles if stimulation is needed in the reeducation following atrophies of disuse or involvement of the nerve; contrast baths, the Pavaex machine, and exercises for the improvement of circulation; various ways of applying heat, radiation, heated air, hot water, hot mud, ionization, and diathermy, all of untold value in relieving pain, in obtaining relaxation, and in increasing circulation; ultra violet light to substitute for the sun's physiological rays; massage, the importance of which to the chronically ill patient is hard to estimate. It relieves pain and relaxes the spastic muscle, stimulates circulation, and induces the active exercise which the patient forced in inactivity requires more than anything else; and, by far the most important, exercise. We can make the patient governor of himself by training him to relax, and to contract muscles to suit his particular need. This demands patience, understanding, and, above all else, such certainty and faith on the part of the director as to instill belief in the most doubting patient. At the same time it demands such knowledge of the condition and such conservatism that failure and disappointment cannot result. Closely allied with exercises we have occupational therapy and just beyond this is vocational training and guidance and recreational and social direction. The value which this entire armamentarium possesses is dependent upon the intelligent insight of those directing the patient. We need recognize no system of treatment. The physical therapist has an excellent opportunity to know the patient, his background, his interests, and what the possibilities for mental and physical readjustment to environment may be. We are attempting to correlate all systems, the great central nervous system, the respiratory, the cardiovascular, the gastrointestinal and the genitourinary to the erect position. The pathologic changes may be so advanced that only minimal assistance is possible, but as greater interest is taken in the chronic patient and a better understanding of the relationship between the upright posture and the physiology of the body is gained, more emphasis will be placed upon prevention and we shall attempt to assist patients in their mental and physical adjustments at a much younger age.

REFERENCES

1. Keith, Sir Arthur: Man's Posture: Its Evolution and Disorders. Br. Med. J. I, 1923. Lectures I—VI, 451, 499, 545, 587, 624, 669.
2. Keith, Sir Arthur: The Antiquity of Man. Vol. I, II. Williams & Norgate, Ltd., London, 1925.
3. Tilney, Frederick, M. D.: The Brain from Ape to Man. Vol. I, II.
4. Goldthwait, Joel E., M. D.; Brown, Lloyd T., M. D., Swaim, Loring T., M. D.; Kuhns, John G., M. D.: Body Mechanics in the Study and Treatment of Disease. J. B. Lippincott Co. 1934.
5. Stroud, William D., M. D.: The Rehabilitation and Placement in Industry of Those Handicapped with Cardiovascular Disease. J. A. M. A., 105:1405, Nov. 2, 1935.
6. Carnett, John Berton, M. D.: Pain and tenderness in the Abdominal Wall. J. A. M. A., 102:345—348, Feb. 3, 1934.
7. Jacobson, Edmund, M. D.: Progressive Relaxation. University of Chicago, Monographs in Medicine, 1929.

Artificial Fever Therapy of Gonorrheal Arthritis

Report of Thirty-one Cases

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Summary and Conclusions

High, sustained, controlled artificial fever is the treatment of choice for gonorrheal arthritis.

Gonorrheal arthritis is a manifestation of a systemic disease, requiring systemic treatment. In vitro thermal death time studies, and the clinical response of patients with gonococcal infections to artificial fever therapy, indicate that it is possible, in most instances, to destroy gonococci in the various lesions of the disease with high, sustained body temperature. In addition to this sterilizing effect, there is evidence that artificial fever therapy stimulates immune reactions.

Thirty-one patients with gonorrheal arthritis, associated with gonococcal infection of the genito-urinary tract, have been treated by us with artificial fever therapy, utilizing a simplified, relatively safe and controllable air-conditioned apparatus known as the Kettering hypertherm. Of 19 patients with acute gonorrheal arthritis the average improvement in joint function immediately after the conclusion of the course of fever therapy was 77.6 per cent; in 3 patients the restoration of joint function was complete. The ultimate average improvement in joint function in the cases of acute gonorrheal arthritis was 98.4 per cent; 13 patients have obtained complete restoration of joint function. Of the 12 patients with chronic gonorrheal arthritis the average improvement in joint function at the conclusion of the course of fever therapy was 62.5 per cent; in 4 patients joint function was completely restored. The ultimate improvement in joint function in the cases of chronic gonorrheal arthritis was 88.3 per cent. At the conclusion of the course of fever therapy gonococci had disappeared from the smears of the genito-urinary tract of 24 patients. The smears of 4 patients became negative within two weeks after the last fever treatment. Supplemental treatment eliminated all evidence of gonococcal infection of the genito-urinary tract of the remaining 3 patients.

A Consideration of Lateral Spinal Curves and Their Neurological Effects

Rodney F. Atsatt and Luella E. Atsatt

The usual paper on Posture deals almost exclusively with deviations from the normal in the anterior posterior plane. Most discussions reiterate for us the common faults of forward heads, sunken chests, prominent abdomens and hollow backs. These anterior posterior curves are fundamental without doubt and always need correction, but enthusiasts in this work often overlook equally fundamental curves in the lateral plane.

The problem of scoliosis in otherwise normal spines is one which has interested us for many years. We are not speaking in this instance of the grave deformities resulting from poliomyelitis where we see not only lateral curves but kyphoses with marked torsion and rotation of the vertebrae, but of the simple uncomplicated lateral scolioses.

Why is this problem worthy of our consideration? Many healthy people have these curves and are totally ignorant of their existence. On the other hand many patients are treated for a variety of supposed ills which are directly referable to such minor deviations. This may seem to be an unusual statement, but multiple vague discomforts, many occipito-temporal headaches, much of asthma, occasionally definite abdominal pains and often radiation pains along the sciatic and femoral distribution are simply phenomena of crooked spines. We raise our eyebrows at the old "ten fingered" osteopath who claimed to relieve headaches, appendicitis and gall bladders by the simple "laying on of hands," but how many of you, your relatives or friends have tried sane surgical manipulation with success? Please do not misunderstand us, we hold no brief for the modern osteopath with his drugs and crude surgery and more or less violent manipulations. We are speaking of the old fundamentalists and the modern doctor of medicine whose manipulative results have laid the foundation for a new science.

How do they achieve the relief of which so many of our patients tell us? The answer is simple. They relieve muscle spasm and disseminate the toxic end products of muscular fatigue. Therein appears the basis of this paper on lateral curvatures of the spine.

The spinal nerve trunks are made up largely of outgoing motor fibers to the skeletal muscles, incoming sensory fibers from skin, muscles, and joint end organs. There are also incoming and outgoing sympathetic fibers supplying in like manner the pleural and abdominal viscera. These trunks lie on or pass through the supporting paravertebral muscles,—which are irritated and put on stretch by a lateral curvature. This irritation may and does become so severe with the onset of fatigue, which is markedly increased because of the disturbed mechanical advantage involved, that a true myositis of these paravertebral muscles is set up. This is easily demonstrated on any such patient by observation and palpation for the muscles on the tangential side of the curve often are tender and occasionally stand out in spastic ridges.

The radicular syndrome of motor and sensory radiation phenomena was originally described by Dejerine in 1914 and has since been augmented by the work of Mayer, Nielsen, Gunther and Kerr and Carnett. Nielsen and Carnett especially were cognizant of the fact that lateral curvature of the spine could cause irritation of spinal nerve roots either by structural changes or by an associated myositis of paravertebral muscles.

Speaking of sensory phenomena only, for the moment, we find various descriptions of pain according to the location of the curve and the consequent level of root irritation. Beginning in the lumbar region, the site of most primary curves we find two great areas of distribution; a sharp lateral deviation with its apex at the fourth lumbar may give rise to pain along the sciatic distribution of the fourth and fifth lumbar segments, namely, the outer side of the leg and dorsum of the foot.

More often, however, the primary lumbar curve is longer in arc, extending to a transition point in the region of the first lumbar or twelfth dorsal. From the more rounded apex of this curve arise the roots of the femoral nerve and we find pain and aching along the anterior and medial aspect of the thighs, lower abdomen, scrotum and testicle.

A still more extensive primary deviation is found in the common lumbo-dorsal curve with apex at the twelfth dorsal and transition point above the level of the sixth dorsal. Irritation of the sensory nerve roots along the tangential side of this curve may give rise to a number of different sensory responses. Parathesias of the abdominal wall simulating to the unwary observer the pain of colitis, appendicitis or gall bladder disease, are common. Ache in the testicle or pain in the ovary may be described, or further posterior, the kidney may seem to be the origin of discomfort. Still higher on the curve there may come off the "intercostal neuralgias" which are often confused with pleurisy.

Ascending in this crooked spine we find at least one secondary lateral curve. This begins at the transition or neutral point of the primary curve and may give way to a tertiary curve, but usually extends to the upper end of the spine. Beginning then at a transition point in the middle or upper dorsal region we find a curve opposite in direction to the primary deviation and approximately equal in extent. In the upper dorsal we find again the intercostal root pains masquerading as heart trouble, lung trouble, etc. Higher we find aching shoulders and necks, and last of all the multitudinous types of headaches.

All these phenomena above described may be due to irritation of sensory nerve roots by muscle inflammation and associated malalignment of vertebral bodies. Turning now to the motor side we find parallel changes from irritation of the motor roots or when the source is slightly further away from the spine, of the combined motor and sensory nerve trunks. Hyperirritability of muscles or muscle groups is found, leading to jerkings or cramps. Atrophies are seen and muscle weaknesses are often present. These conditions occur in exactly the same manner as do the sensory changes differing only

in the function of the nerve and are found at different somatic levels corresponding to the vertebral segments involved.

Now we will treat a different side of the neurological system. Ussher has pointed out that actual physiological changes in viscera may occur as the result of irritation of the sympathetic visceral fibers. He designates this physiological response as "The Viscero-spinal Syndrome" and has presented cases in which symptoms of appendicitis, gall bladder disease, ureteral colic and other manifestations of visceral disease were relieved by some correction of spinal curvatures. Some of these cases had been operated upon previously without relief and several more were seriously considered as being surgical prospects. Referring again to Carnett and adding the name of Wills we find that the surgical profession is becoming cognizant of the fact that disturbed visceral physiology is possible from remote somatic pathology and that oftimes simple measures for the relief of abnormal function in the skeletal system may dissipate a seemingly surgical condition. From a medical standpoint also we have seen spastic colitis and obstinate constipation completely disappear with a correction of the underlying cause of the viscerospinal syndrome.

Thus we see visceral physiological processes definitely affected by spinal curvatures in addition to already widely known motor and sensory phenomena.

We will now discuss the usual causes of scolioses of the spine. The most common is the typical short leg where the measurements from the anterior superior spine of the ilium to the internal malleolus show a differential of a quarter of an inch or more. (Mensuration giving a difference of less than one-quarter inch cannot be relied upon for accuracy.) This short leg gives rise, usually, to a long lumbo-dorsal curve with a neutral or transition point above the center of the dorsal spine. There may follow a secondary dorso-cervical curve. Occasionally the short leg gives rise to a sharp lumbar, secondary lumbo-dorsal and tertiary dorso-cervical.

Another allied causative factor, giving identical curves is that anomaly found when one acetabulum is placed higher on the ilium than is its mate. This in effect gives a short leg and tilted pelvis.

Another type of causation is found in anomalous changes in the top of the sacrum and in the fifth lumbar wherein the basal structure of the spine itself is tilted or asymmetrical thus giving the spine an initial inclination from the normal vertical. This type of change is usually productive of a sharp lumbar with its compensatory upper curve.

A third cause is found in those spines in which the foundation, that is the top of the sacrum or 5th lumbar, has been altered in conformation by injury or disease. These are more common than supposed, for asymmetrical compression fractures of the 5th lumbar are seen often enough after moderately severe falls to make us realize that many go unrecognized.

The fourth and last etiological factor is the mild polio spine, one in which the disease was undiagnosed and whose after effects are demonstrable only by the residual atrophy on the convex side of the curve in the lumbar or dorsal region.

You may well ask at this point, why is it with these long standing factors as the cause of the symptoms, that the onset of the symptoms is delayed until adulthood or later in life? The answer is simple. The neurological complications of scoliosis are governed largely by fatigue and come as the result of lowered skeletal resistance. The forces of gravity continuing to act over a long period of time gradually increase the off center curves, increase the muscle fatigue and irritation and thus give rise to the nerve stimulation, often climaxed by some incident such as long bed rest, unusual fatigue, or strain with muscle atony and atrophy.

In the diagnosis of these lateral curves the X-ray is often of distinct value. The simple long curves are easy to recognize but the complex deviations, especially where the malalignment originates with a sharp lumbar curve require special X-rays to give the true picture. These roentgenograms must be taken in a very particular manner. The patient must be standing with his weight evenly on both feet, knees straight, arms at his sides and looking straight ahead. An X-ray taken by this method gives an actual projection of the lumbar and lower dorsal spine as it functions in the erect position and the lateral deviations and the causes therefor are then easily determined.

The treatment of this problem falls into two classes the structural and the physiological. The mechanical type of correction is simple, an appropriate raise on the heel of the short leg gives the increase in length required. When the short leg is in a child, an additional corrective measure is possible. Unclosed epiphyses grow as the result of stimulation and it is possible to stimulate the lower extremity epiphyses to greater activity by hopping on the short side. This will often change the differential measurements as much as one-quarter of an inch in two months.

With the sharp lumbar basic curve there is often a question as to which side to put the raise upon. The general principle of course is to raise the low side, but in an adult the primary curve is often so fixed as to make it necessary to disregard the primary curve and correct the secondary even at the expense of increasing the basic deviation. Likewise in polio spines the heel correction must be used to change the maximum curve disregarding mild artificial curves which may be created thereby.

The physiological treatment falls in the realm of physical therapy. The first step is the correction of the anterior posterior curves for with the increase of muscle tone and sense of posture balance that comes as the result of these exercises for the strengthening of weak abdominal and back muscles, there is inevitably an improvement in the lateral curves. When postural correction in this plane has been well established and the patient is posture conscious, it is then possible to add the asymmetrical exercises for specific lateral deviations. This whole program is tedious and often a long one, but the results obtained are very gratifying.

This concludes our presentation of a rather complicated and only partially developed subject. We have endeavored to bring to your attention that many patients may have neurological effects from unrecognized or neglected lateral curvatures of the spine, that many disturbances in the physiology of remote structures are possible, and that all patients in whom no definite pathological changes can be found are not necessarily hypochondriacs.

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Effect of the Pool on Technicians

Robert L. Carroll, M. D.

If technicians have been in the pool steadily for some length of time, fatigue is noticed greater than that from similar types of work outside of pool and pressure of the water is also noticed particularly when waders are worn.

Our technicians at the Orthopedic Hospital have always worn waders which come almost to axillæ, and although these waders are made of extremely light material, when the water presses them against the body they necessarily wrinkle and frequently pinch the skin in a wrinkle. To relie e this situation, it was thought it would be a simple matter to put in some solid supports which were first used in the form of a celluloid mould to relieve the pressure from the dorsum of the feet. This was tried, but was just as uncomfortable as the pressure. Only a few of the technicians complained of pressure on the feet, and we continued just with the heavy rubber boots which were vulcanized to the light weight waders.

An effort was made to determine reasons for fatigue other than the length of time at work, and a series of blood pressure determinations were made under varying circumstances. It was thought that the pressure of the water would increase the blood pressure, and for the moment physiology was not considered, but it was soon found that the problem was one of physiology and not of mechanics. In other words, it was found that the blood pressure responded to the temperature and not to the pressure. In the warm pool of 90° to 92° F., the blood pressure would drop according to the depth of the water in which the technician was standing, and this drop was practically immediate, in a matter of two or three minutes, due to the dilatation of the blood vessels from the heat of the water. This drop in blood pressure would remain practically the same as long as the technician was in the pool and would rise to normal as soon as the technician left the pool and even a little above normal, then subside to normal in a few minutes. This slight rise above normal was doubtless due to stimulation from the cooler air and temporary constriction of the blood vessels. The usual drop in blood pressure was about 20 mm. of mercury in the warm pool of 92° F., with the technician standing in water to waist, and this relaxation from the heat over a period of hours, especially when the technician is in the pool, frequently is too much for her own good.

To relieve the pressure from the legs and determine the effect on blood pressure, if any, a metal band was made into spiral with the diameter about one inch more than that of the leg, and was put in the waders and reached from the trochanter to the ankle. There was enough movement in the spiral to allow ample knee movement, but the pressure of the water pressing on each side of the spiral tended to collapse it against the leg, which caused more discomfort than the pressure of the water alone, so this idea was necessarily discarded, and a series of metal rings were then made and fastened in a brace-like manner with side bars and hinge at the knee joint. This was put inside the waders, but the pressure of the water would press in between the rings and caused an uneven pressure against the leg, and this condition was likewise unsatisfactory. Lacing between the rings was then done with webbing straps, but even then there would be some bulge from the pressure of the water, and a solid sleeve was then made of celluloid from a mould. This was put in the waders from the trochanter to the ankle and effectively kept the water away within the sleeve, but it would cause pressure against the leg at each end, especially the upper where it pressed against the perineum on account of water displacement, and this was uncomfortable. Since the sleeve was stiff at the knee, walking was awkward and difficult, and this was used only experimentally without any idea that it would be practical.

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Read at the annual meeting of the American Physiotherapy Association, Los Angeles, California, June 29, 1936.

The blood pressure was practically the same when the technician wore a swim suit or waders with or without supports, and reacted according to the temperature of the air or water about the lower extremities, so the only good supports would do would be to relieve the pressure about the lower extremities, but, since the supports were pushed up on account of the displacement of water, neither the buoyancy nor the pressure of the upper part of the support was comfortable and hence this idea was discarded and heavy cotton athletic suits were advised to be worn underneath the waders to prevent pinching.

Practically all of our work here at the Orthopedic Hospital is done with the pool at 92° F. or warmer, but for experimental purposes determination of blood pressure was made at varying temperatures from 72° F. up. In the cold water there would be an immediate increase in the blood pressure due to the stimulation of the cold causing constriction of the blood vessels rather than dilatation as happened in the warm water. This rise would be preportionate to the temperature. At 72° F. there would be an immediate increase in blood pressure of approximately 30 mm. of mercury which gradually dropped some due to the readjustment of the vascular system as well as to the inactivity of the individual, and doubtless due to the rising temperature of the film of water next to the individual, from body heat when sitting or standing still. The solid supports were then used in the waders and the effect on blood pressure was found to be practically the same; that is, the hot and cold water would immediately react upon the feet and the temperature inside the supports around the leg would have effect upon the circulation according to the temperature. In the cold pool as the temperature of the air around the legs would increase some from body heat, so would the blood pressure drop some. Hence it would seem that the temperature of the air would have definite effect upon the vascular system and a tube was put down inside of the sleeve around the leg through which compressed air was blown, and the blood pressure would rise immediately, though not very much with the stimulation of the cold air, and as the air would warm up from the body heat the blood pressure would drop. The rise in blood pressure was found to be greatest when the circulation of air was most adequate as in the solid sleeve made of

celluloid, which of course allowed the best circulation of air.

Since the blood pressure dropped from heat and there was some rise from stimulation of cold, a half-way point between these extremes should keep the blood pressure practically without change, and this was found to be the case at a temperature of 84° to 86° F. Needless to say, different individuals reacted differently in degree, but all in the same manner.

Inasmuch as no support to hold the waders away from the legs was found to be satisfactory and the matter of forcing cold air was not practical, about the only thing left to change was the temperature of the water, and to do this at least three pools should be available and preferably four. Patients in acute stage of illness or trauma will not stand much cold, especially adults, and temperatures under 90° F. are not practical for them, hence a warm pool up to even 94° F. is necessary for what may be called acute cases, but for ambulatory cases who come in from outside for treatment a cooler pool should be to their advantage as well as to the technicians, and this should be practical in a pool 86° to 88° F. A salt pool is necessary for drainage cases, and as these cases are usually acute, and as there is benefit from increased blood supply through dilatation from heat, the pool is necessarily warm, and should be around 94° F. For such cases as spastic paralysis where maximum relaxation is wanted, a temperature of about 96° is desirable.

For a while technicians would weigh before going into the pool and on coming out, and it was found that almost a pound was lost in two to three hours in the warm pool. Sweetened fruit juices were then served to the technician while in the pool, which liquids replenished the loss from perspiration so that the average loss was only about one-half a pound for the same period.

A few blood sugar determinations were made before going into the pool and after being in the pool for two to three hours, but no marked change was found. Further laboratory work is to be done.

A questionnaire to the technicians revealed that no one felt particularly tired after two hours in the pool, but all would feel tried after three hours. With some of the technicians their feet would swell after being in the pool for about three hours, whereas this was not particularly noticeable after being in the pool for a two-hour period.

Technicians elsewhere have worn bathing suits, which of course are more comfortable for a while, and the chlorine in the water will cause no trouble for a short period of time, but will doubtless irritate the skin of anyone being in contact with it over a period of years, and once a dermatitis of this nature has begun, it is hard, if not impossible, to cure it without keeping out of the water entirely; hence we have always used the waders for our technicians.

To solve these problems by not going into the pool, but by directing the activities of the patient while the technician stands outside of a small pool raised from the floor presents other problems inasmuch as the patient cannot be handled as well from the outside as with the technician standing in the pool by the patient to help the patient with whatever movements are indicated, and to bend over a pool to try to do this is certainly inviting back strain.

CONCLUSIONS

1. The technicians' blood pressure drops some when in warm pool and is maintained or changes little in a cold pool.

2. It seems advisable for the technicians to wear waders when in the pool with thick athletic units underneath for the protection of their skin.

3. At least three pools should be available, one for acute cases above 90° F., one for ambulatory cases below 90° F., and a salt pool for drainage cases.

4. A two-hour period in the pool three times a week is advised for technicians, and also sweetened fruit juice is recommended to be served to technicians while working in pools above 90° F.

Relation of Physical Defects to the Physical Growth of Children in Different Geographic Regions of the United States

Physical Measurements Studies No. 4

William M. Gafafer in Am. J. Hygiene 23:2:205, March, 1936.

Summary

The purpose of this paper, the fourth of the series is the investigation of the influence of geographic location on the effect of physical defects on the physical growth, rate of physical growth and body form of elementary school children. The physical measurements include the following seven: Body weight, standing and sitting heights, chest circumference, transverse and anteroposterior chest diameters, and vital capacity. The selected and computed indexes of body form are four in number and include weight over height, sitting height over standing height, anteroposterior chest diameter over transverse chest diameter, and chest circumference over standing height. The physical defects include, principally, carious teeth, defective tonsils and adenoids, goiter, enlarged cervical and submaxillary glands, and defective vision. All of the measurements are specific for sex and age.

On the average, the defective group of each region is lighter, shorter, has shorter trunks, and less vital capacity than the non-defective group of the corresponding region; there is evidence to suggest that in each region the defectives have narrower and smaller chests. The four mean indexes of body form show for each region that the group with defects is less stocky, and in relation to standing height has long trunks and large chests. The two groups in each of the three regions showed no consistent differences in their rate of growth as measured by mean annual increases in each of the seven physical measurements. The results indicated thus far are in harmony with the findings of the previous paper of the series where no reference is made to the differences in the geographic location of those measured and examined.

The methodology employed disclosed no evidence that the difference in geographic location of the children with recorded physical defects influenced their physical growth, rate of physical growth or body form.

Normal and Abnormal Mental Mechanism

James Houloose, M.D.

A glance at your program indicates that you are specialists. It also indicates that as specialists you have not lost sight of the whole individual. It is encouraging to the mental hygienist to see that you as therapists, in a very intricate and specialized field, while concentrating your efforts upon the functioning of an injured member, a special group of muscles or the correction of postural defects, have not lost sight of the fact that the efficient functioning of the individual depends upon the integrative action of the whole body. This integrative action, as you so well know, includes the physiology of muscles, nerves, glands, organs, bone and brain. It also includes the social implications of adjustment which is as much physiology and psychology, as sociology. This ability to adjust depends upon the sum total of the individual's heredity as well as the sum total of his environment. There was a time when, to the eugenist, heredity was the greatest factor and only recently the environmentalist, under the leadership of Watson, pronounced the dictum *that behavior was determined by habit training or the setting and resetting of the environment, producing* thus, *the greatest development of the individual.* I repeat, it is encouraging to see a program of a national organization, which includes the consideration of the whole individual.

My subject, "Normal and Abnormal Mental Mechanism," includes this consideration of the "wholeness" of the individual. You, as specialists in the field of physiotherapy and I, interested in the specialty of mental health, have many things in common. We understand the physiology of exercise, the function of nerve tissue, the structure and function of bone, the relationship of the endocrines to growth, the catalytic action of the vitamins upon nutrition, the psychological effect of success, enthusiasm, ideals and happiness upon the development of the personality. We also understand the obverse of this, for our very vocation has forced us to become aware of a reality which presents to us a daily picture of malfunction, maladjustment and maladaptation. You see these phenomena in the physical while I see them in the psychological field.

For want of a better name we call the processes of physiology, psychology, sociology and pathology, mechanisms. This does not mean that science has reduced these phenomena down to the tires, wheels, the springs, chassis, upholstering, gas, lubrication, ignition, carburetor, spark plugs and engine of the current Ford. The meaning that is being used here is rather that expressed by such authors as C. Judson Herrick in his book, "The Thinking Machine," and Walter B. Cannon's "The Wisdom of the Body" or Howe's "Motive or Mechanism of the Mind" as a mental attitude. This attitude views these phenomena as having a definite origin, a drive toward completion and, through this completion, the setting up of a pattern. As the phenomena may have its original stimuli within or without the individual, so also may the drive be completed within the individual or in his environment. In the human being these phenomena probably originate from the primary instincts of hunger, sex and the herd. In man's long road to his present civilized and socialized state he has used first one and then another means of attaining the satisfaction of these primary instincts. Through the evolution of the cortex, he has been able to superimpose his will upon many of the elements of nature, thus to turn these into constructive rather than destructive forces. He has been able to develop the sciences of astronomy, mathematics, biology and recently psychiatry, two branches of which, psychology and mental hygiene, give us the materials for our discussions today.

The most common of the normal mental mechanisms are: sublimation, repression, identification, introjection, rationalization, projection, compensation, conversion, symbolization, condensation and displacement. These have their origins in that special part of the body which we have been in the habit of calling the brain. They are influenced by those factors within the self which we know as the emotions, the physiology of the organs, the homeostasis of the body fluids, bacterial invaders, the physical elements of heat and cold, and the forces of the social matrix within the environment. The drive of the mechanisms leads to a definite pattern of behavior, the normal tendency being to produce an adjustment of the individual with himself and his environment. This infers an integration of the mechanisms as under control of the individual whose goal and whose pleasure lies in social approval and ends, as a result, in his own happiness. As you have seen the normal mechanism of hunger lead an individual to secure the satisfaction of that hunger through food, you have also seen some whose hunger could not be appeased and developed a pathological appetite, and then as a result, over-eating, headaches, nausea and vomiting. *It was not the mechanism, as such, that was at fault; it was the fact that the mechanism controlled the mechanic rather than that the mechanic controlled the mechanism.* The abnormal pattern may become a fixed mode of action and thus from the normal one may go step by step to the abnormal, from the physiological to the pathological, from a pattern of behavior to a pattern of life, from adjustment to maladjustment, from social approval to crime, from success to failure, and from sanity one steps onto the threshold of insanity. The route and the time element are factors which at times obscure the direction, but sooner or later the result is always the same; but, out of control, these mechanisms lead to abnormality, psychopathology and insanity.

Let us observe at first hand one or two of these mechanisms. Identification is a mechanism by which one acquires the attributes or the ideal which the other person or object represents. In its simplest form this mechanism of identification gives rise to patterns of behavior through imitation. Thus mannerisms, affectations, slang, types of dress, vocational, religious, and political choices are made not by the exercise of absolute free will but by imitation which is linked by identification to the ideal. "Identification represents a wish to be the person admired or loved." Through identification we enjoy the heroine or hero of a play, through identification we see in the novel a fellow martyr, we sympathize, we suffer, we grow restless and we may revolt. Through identification the minister's sermon of yesterday had a special significance and meaning for us. Through identification certain passages of scripture refer to us. Thus, through identification we pattern our behavior and finally our

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lives after poets, artists, martyrs, heroes, saints and sometimes after those of less worthy types. This mechanism has its normal limitations and when, as so ably set forth by Dodge and Kahn in their little book, "The Craving for Superiority," these limitations are overstepped, pseudo-goals are wished for, then failure, disappointment and disillusionment are just around the corner. When you, through imitation, fantasy and identification, so lose contact with reality that you no longer are you but are the wished for, the identified ideal, then the mechanism of identification has fooled you. Instead of being you, you now are your father, Napoleon, Jesus Christ, the hero or the martyr. In the art of the drama one sees through clever acting these mechanisms carried out in its highest degree of normal development. As an audience you see Katherine Cornell identify herself as Joan of Arc and you feel and think not of Miss Cornell but of Saint Joan.

The danger zone lies in allowing the mechanism to become a pattern of life rather than a process. Such identification now adds other psychological elements. The first probably is that of ideas of reference. You hear people say, or you infer, that they do, that you remind them of their ideal. You act, you talk, you behave like so and so. Or you are led to believe through this element of abnormal identification that people are now talking about you, in a minor sort of a way they are persecuting you. *It is just a step from this phase to simple hallucinations; you now see, you now hear, you now sense that as Joan of Arc was maligned and martyred you, too, are becoming the victim of martyrdom.* The next step is that of a delusion state. You not only think that this might be so, you not only have hallucination, but all of your thinking and feeling is so organized and systematized that now the imitated, the idealized has for you become the reality, while you yourself are the unreality. Ill health, disease, financial loss, disappointment in love and a hundred other factors may have contributed, but in the main thus are delusions born. The clearest exposition of this mechanism is available to all in the Autobiography of Clifford Beers, as presented in the "Mind That Found Itself."

The next mechanism that is used constantly by all of us is rationalization. This device prevents us from seeing ourselves as others see us. It is mental camouflage. "It changes and bedecks or camouflages unworthy motivations, so that to others and even to ourselves, they appear satisfactory and even praiseworthy." Whenever I wish to illustrate what is meant by rationalization, I refer to the Autobiography of Lincoln Steffens and his comments regarding Theodore Roosevelt. The latter had just been discharged from command of the Rough Riders at Montank. With Steffens he was on his way to New York to consult with friends about running for Governor. Platt was then the Republican State Boss. He was hated by the Reformers. Roosevelt was a Reformer but Roosevelt wanted to be Governor so it was politic for him to make a concession or concessions with the hated Boss. He made his call on Senator Platt. The Reformers had him; he must deny that he saw Platt. Steffens suggested that Roosevelt write a statement denying the visit and set the statement up on his desk and read it before and after meals, till in a day or two he would come to believe it himself. It will be true then and then give it out. Roosevelt replied, "I can do that, I can do it." History relates what happened. He made a public denial, was elected Governor. This rationalization served the purpose of justifying personal conduct.

Another example may be given. When Henry the VIII found that his marital ties interfered with his love for Anne Boleyn, he was able to discover that it had been unholy and unlawful of him to wed his brother's widow in the first place and the dissolution of his marriage became an act of virtue.

Rationalization as a means of self-justification merges rapidly into self-deception. There are varying degrees. The man who periodically "swears off" only to take up the habit again because he couldn't refuse a friend. The tyrannical foreman declares that to get out the work, he must enforce rigid discipline.

In California rationalization has been given legal sanction, for after duly considering a crime committed the individual may plead not guilty by reason of insanity.

It is not a very broad jump in mental gymnastics to go from rationalization to purposefully planned lying. It now has lost all semblance of being a mechanism which "saves face." In the realm of international activity Italy's example of stating to the League of Nations that it was not at war in Ethiopia because it had not declared war may be called diplomacy or rationalization. Thus, we advance to one more step in rationalization to that of pathological lying. A pattern of life adapted by those who lie because they have lost all insight into the relative value of truth or honesty. They actually do not know that it is themselves they are cheating. Thus again a normal mental mechanism is shown to have legitimate value as a controlled mechanism, but becomes a pathological one as soon as the mechanism becomes the master rather than the means to an end.

Not so long ago a lad was referred to my office because of maladjustment in school, at home, and in the community. He was of better than average intelligence, of good body, of fair economic and family situation; yet he was in trouble. His mother stated he was incorrigible, his school had suspended him because of truancy, vulgar remarks and actions before girls of the school and "freshness" to teachers. He was under juvenile parole because of stealing money from the cash registers of service stations. In the psychiatric examination it soon became apparent that he was mastered by a mental mechanism which under normal conditions is a help. He was not to blame for these things. At home his mother, father and brothers were always picking on him; at school he was always tricked by some boy or girl into some misdeed; in fact, most of the times they had done it but he had to be the goat or to take the rap. In the community he did not actually steal. He was going to replace it the next day. As he was intelligent and as these stories were broken down into elements which he admitted were just fabrications, he finally burst out with "it is not my fault, it is the little devils in me." He could not take the blame but projected it upon his family, his school and classmates and finally upon the "little devils."

The ability to fool one's self by placing the blame upon others is one of man's simplest safety devices. As a mental defense mechanism it has no equal. It, like any other good thing, may be over done. In this over doing lies the danger; for soon, I will have so fixed my habits of thinking that I am no longer responsible for what I do. The circumstances of the environment, my family, my friends, my occupation and maybe the laws of the State are the basis of my projection. This mechanism in every day parlance is usually spoken of as "passing the buck."

When this mechanism is turned in upon one's self, it may be the beginning of a train of symptoms, which will ultimately lead to psychasthenia, neurasthenia or hysteriod reactions and way of life which leads to chronic

invalidism, personality disintegration and a paranoid type of psychosis.

An illustration of projection being used in this way may help. John had always thought himself physically interior. During his high school days his ambition had been to make the football team. He tried and tried each year but was always relegated to the third team. He had a type of body build which did not lend itself to the ruggedness of football; yet he was healthy and for his type, strong. In college he met similar luck. His determination bordered almost on the heroic. During his senior year he did make several trips with the team and was used as a substitute occasionally when his understudy had to be taken out for instruction or rest. He did not get his letter. Then work and in a few years marriage. His marriage was to find him a failure. After six years of married life there were no children, which both desired. He made excuses to his wife, to his friends and family that he was not well. He had a chronic intestinal condition which was constantly the cause of disabilities. He sought the advice of a physician after physician, finally a surgeon suggested removing the appendix. To the interne the surgeon suggested that this was not an out and out case of acute or chronic appendicitis but had many mental aspects and directed the interne to get an elaborate history, to do all the necessary laboratory work and if possible develop a friendship through which psychotherapy might be instituted. The interne was sympathetic, painstaking and friendly. The patient began to ask questions. They talked freely and under the guidance of the surgeon, the interne discovered the patient's delusional trend about his own inferiority. The operation was performed; the appendix was normal and exploration did not lead to the discovery of any pathology. It was discovered that his secret obsession was that he was sexually impotent, because of his physical inferiority. He had projected all this upon his intestinal disorder and appendix. The post-operative period was prolonged. He was given an understanding of the various functions of the body. He was finally assured that he was a normal individual. He was not blamed, but because he needed guidance a very definite program was outlined. He was seen at scheduled intervals. He increased in vigor, his whole attitude changed. As a result of the history and an understanding of the inferiority feeling and obsession, the wife was examined. A minor operation and in due season a bouncing boy and a family salvaged from disaster.

In this case the shipwreck might have been caused by the normal mechanism of projections being turned into an instrument of self depreciation and obsession. Beware of projecting!

The other day in the cartoon "Regular Fellows" Puddin' Head was seen to be hunting for a cork. He wanted one just the right size and when he was asked why and for what purpose he stated that it was to be placed in one of his ears because it seemed to him that the directions given to him by his mother were heard all right but passed right through from right to left without stopping long enough to become impressed upon him.

Forgetting is a mechanism which when consciously applied we speak of as a repression. The usual application of this mechanism is a blessing for who could tolerate the train of associated ideas, instances and happenings that would occur with each stimuli. Repression stands guard and helps one forget the unimportant. Especially does repression help one to forget those experiences, situations, association of ideas or trains of thought which are distasteful. Used as such repression may be wholesome, in fact a life saver; yet it may be used to such purposeful ends by the individual that it becomes a pattern of behavior. Thus, the individual becomes so dominated by this mechanism that he or she becomes amnesic. He develops amnesia for a certain episode. He doesn't know who he is, where he came from, where he lives, when he was born, what his occupation was, etc. Not so long ago a man murdered his sweetheart, because she would not marry him. He left her body in the car in which they had been riding and then he wandered about the town. Early the next morning he surrendered to the police, told his story and definitely admitted his part of the crime. He then became mentally disturbed. He could recall who Jennie was, what town she lived in, what she would be doing now under ordinary circumstances, but that she was dead, and that her death was at his hands. No! that he could not recall or remember. After many months in an asylum there was a recovery; his recall, his memory was quite adequate, somewhat spotted as it were, but for the murder of Jennie, he was entirely amnesic. Purposeful forgetting to a pathological degree would at least make him appear innocent before his own conscience or censor, and probably before enough of the jury to impress upon them the idea of a reasonable doubt and thus he might escape the penitentiary or the noose. This ability to purposefully forget must not be confused with the amnesia due to cerebral accident of the nature of skull fracture, concussions or apoplexy or that following epileptiform attacks or to that of a narcosis produced by ether, morphia or alcohol. In this type of amnesia, which is traumatic in a sense, there are two types, retrograde amnesia, involving only past events, and in direct proportion to the severity of the injury. A nurse sustained a skull fracture, the injury occurred in May; yet the recall of events prior to May, were all in the month of February. In retrograde amnesia the absence of memory is not progressive. The second type, anterograde amnesia, is for recent events and is progressive and characteristic of such conditions as senility, marked cerebral arteriosclerosis, and in some cases of chronic alcoholism. In the latter the individual practically never recovers.

One other phase of repression which often leads to the development of an abnormal pattern of behavior is a type of psychological blocking. The individual represses, not only the experience of the past and thus blots it out, but he may also purposefully block out the present. Certain religions practice this mechanism; thus by auto suggestion Cultist and their followers block out from consciousness realities; while others advocate the repetition of thought, phrases and jingles to block the incongruities of every day.

It has been the experience of all of us, to be talking to a patient, friend or relative, and although there is nothing else in the environment to distract his attention to have him entirely ignore what has been said or asked. To make you feel good, to start a conversation or to make a social contact some people have the habit of directing questions to you or the group; yet they block out the opportunity to answer, to make the explanation, by another question or by their own explanation.

The repressing of the immediate environment and situation while of advantage now and then may of course be a means toward the development of traits which will lead directly to mental disorder and phychosis.

What does this all mean to you as a physiotherapist? First, it should make you conscious of the purposefulness of your own atttudes, emotions and behavior in relationship to your own happiness, to your work, as a general

thing, and to your patients. Second, it should give you an insight into the behavior of your patient. Is his attitude toward himself, to his misfortune, to the treatment one of understanding and of reality or does he obstruct all you try to do by mental mechanism which although normal, may through habit, repetition and over emphasis develop into patterns of behavior that border on the abnormal and thus to a pattern of life which leads toward a definite maladjustment.

You may as physiotherapists function to the body —the limb, the muscles, to posture, to locomotion but you may also function as psychotherapists. Through mental hygiene attitudes and concepts you thus may increase your service many fold.

Some Notes on the Use of Physiotherapy in Pediatrics

William M. Happ, M. D.

In considering the uses of physiotherapy in the field of pediatrics, we should first consider some of the fundamental physiological aspects of the conditions for which physiotherapy is used. The application of mechanical principles to the correction of physical conditions in children is bound to be ineffective unless the underlying conditions are understood, unless physiological deviations from normal are appreciated and the proper discrimination used in the selection of cases for physiotherapy. The coordination of the medical care of the patient along with the physical therapeutic is essential for good results.

In the beginning, it may be stated that a good part of the failures of physical therapeutic treatments in children are due to a failure to consider the above mentioned points. As we are all anxious to improve our results, it was thought that a review of some of these principles might be instructive to a group of workers actively engaged in the practice of physiotherapy among the young.

Let us first consider the question of posture correction. It seems to me that failure to achieve better results in body posture work is due to the following causes: First, the failure to recognize variation in types, based chiefly on hereditary factors and the attempt to bring all children to a standard which is obviously impossible. Second, the failure to recognize the fact that the presence of fatigue is an inevitable stumbling block to success in posture work and that much time is wasted in attempting to correct the posture of fatigued children. Third, the failure to recognize the influence of endocrine and metabolic influences on body build, which greatly influence any attempts at correction. Fourth, the importance of the time element in the achievement of results as observed over a period of years.

In accepting a posture case, an arrangement should be made to observe and treat this case over a period of years. Instead, the case is usually treated for a few months until improvement is noted and then dropped. This is especially true of school posture work. This improvement is often transitory and the patient's posture may return to its former status.

Let us return to a more detailed consideration of these points. As a practicing pediatrician, I am tremendously impressed by the importance of hereditary influences on body build. These influences manifest themselves at a very early age; sometimes as soon as the infant is able to stand. The degree of muscle tone, ease of fatigability, muscular and ligamentous relaxation, laxity of the joints, growth tendencies as departures from the average with postural changes subsequent to these factors, are easily recognized as following hereditary influences on body build which are of great significance.

Equally important are the hereditary tendencies to leanness (linear type) and to heaviness (lateral type) in body build. The former is, of course, the type which is associated with muscular relaxation and easy fatigueability, and is known as the asthenic type (typus asthenicus). These children constitute a real problem in the practice of pediatrics, and the degree of difficulty is commensurate with their ease of fatigueability. If fatigue is slight, more can be accomplished in postural correction. Therefore, the child must be taught to rest—a feat accomplished with some difficulty in many—and to minimize fatigue.

The important thing for the physiotherapist to recognize is that here one is dealing with a child who is a variant from the commonly accepted average, or normal, and that under no method of treatment can the body build be brought to the standard prescribed as perfect, or normal. This should not be constituted as a statement that treatment should not be used on this type of case, but that the physiotherapist should attack the case with eyes open to the potentialities of the patient, and the limitations in improvement. The fault lies chiefly in our placing ideal standards of body build, which are seen on the charts adorning the walls in posture rooms, but seldom seen in practice. This goal is attainable by a certain percentage, but not by all. What we can do is to minimize the defect, minimize the fatigue, and assist the child in growing into an improvement over the parent, whose body build he has inherited. These children need encouragement and persistent work over a long period to aid them in overcoming handicaps and in preparing themselves for adult life.

One of the most important as well as difficult points in physiotherapy is the recognition of physiological development in growth and its variance in the young child. The infant shows certain characteristics which are normal to infancy. These are:

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1—A marked protrusion of the abdomen consequent to a relaxed abdominal muscle tone, giving the familiar "pot belly" of infancy.
2—A bowing of the tibiæ present in infants at birth and continuing throughout infancy.
3—A varying degree of knock knee present in all infants.
4—A varying degree of digamentous and muscular relaxation which gives the normal infant, on learning to walk, a standing posture which has the following characteristics:

The feet are placed far apart and everted in "Charlie Chaplin" style.
The ankles are pronated.
The feet are flat on the floor without visible arch.
The legs are bowed and decidedly knock kneed so that, with knees touching, there is from 2 to 3 inches between internal maleoli.
The abdomen protrudes markedly and the navel often protrudes slightly.
There is consequent pronounced lordosis, the shoulders are drooped, the head is held inclined forward.

Thus, the infant begins life in the erect posture and must evolve from this to the adult tvpe of erect posture.

But this change is not accomplished over night, but by a gradual evolution involving improvement in muscle development and tightening of ligaments through exercise and use. In many children, this change is fairly complete at three years; in others it is accomplished later. From a practical standpoint, it is important to remember this fact, as many young children of two and three years are treated for knock knee, bow legs, pronated ankles, etc., which are physiological and would correct themselves in time if left alone.

The difficult point is to decide where departure from the physiological exists and treatment should be given. This is an individual matter and involves, not simply an examination of the feet and legs, but of the child as a whole.

Abnormalities consist in:

1—An exaggeration of the normal variation, as in bow legs, and
2—A continuation of this condition after the period when it usually corrects itself, as in knock knee.

Delay in correction is seen in heavy children, due to weight bearing, and in thin children due to lack of tone. Assistance in proper development through proper shoeing with mild correction and simple exercises is permissible and often helpful.

A carrying over of these infantile characteristics into childhood calls for definite corrective procedures. Continuation of the infantile type of abdominal relaxation into childhood is responsible for many cases of constipation. Properly directed exercises to develop abdominal muscle tone, combined with massage and, of coure, with a proper diet and habit regulation, will correct many chronic cases of constipation which are usually neglected. These are satisfactory cases, as the mother has been unable to correct the condition until these measures have been instituted and one is rewarded, not only with satisfactory results but the pleasure of rescuing a child from a cathartic habit which may carry over into adult life.

Continuation of muscular and ligamentous relaxation is responsible for postural charges which deserve attention, and active exercises may be begun during the pre-school period with surprising cooperation by small patients if the physiotherapist proceeds slowly, gains the confidence of the patient, and utilizes games and play in accomplishing the results.

Better results may be obtained in young children if the physiotherapist goes into the home and works with the patient there, for several reasons. The child is at ease and his cooperation can be readily gained. The mother may be utilized in assisting in the work and in carrying it on in the absence of the physiotherapist. The latter can size up the home situation and study pand report to the pediatrician about the child's environment, his schedule, his rest and activity, his play, and the degree of parental cooperation, and greatly increase this cooperation. Results can be obtained by only the united results of the parents, child, doctor and physiotherapist.

A study should be made of the child's bed, chairs, table and furniture, as these are very important to the child's posture. Much time is wasted if careful attention is not paid to such small details, and unless both the work and the cooperation are continuous and not limited to a half hour several times a week and not thought of in the interim.

There are many other uses for physiotherapy in pediatric practice which cannot be touched upon here. Among them is muscle testing for mild, or so-called abortive cases, of poliomyelitis, real or suspected, which gives the pediatrician information of great value in these border-line cases, work with mild spastics, with certain congenital deformities, with empyema cases in preventing deformities and in convalescents from various diseases, etc.

In summary, my plea is for a consideration of the child as a whole, as a unit and as an evolving mechanism emerging from the prone, helpless and immature posture of infancy to the vigorous, active, erect child. This child is bound to certain hereditary influences in body build and develops certain characteristics which depart from the accepted normal or theoretically perfect build.

One must study the child and his progenitors, his environment and his capabilities. It is important to recognize fatigue and minimize this before beginning corrective treatment, to eliminate, if possible, chronic infections and to give the child a schedule best suited to that individual.

It is important that corrective treatment be individual and not collective and that attention be paid to the physiological aspect of the child so that he will not feel inferior to his mates. He should be fitted as best he can to withstand the storms of growing up, and to develop a physical mechanism which is optimum for the given child that he may be in the best possible condition for competition in the struggle for existence.

Social Security for Crippled Children in the United States

Robert C. Hood, M. D.

The signing of the Social Security Act by President Roosevelt on August 14, 1935, marked the culmination of efforts on the part of many groups and organizations engaged in securing adequate services for crippled children as a recognized public responsibility. Foremost in this group of organizations was the International Society for Crippled Children whose interest is centered on the handicapped child. It is, therefore, proper that this organization should be among the first to learn of the steps which have been taken by your Government for the development of this work.

Parts 1, 2, and 3 of title V of the Social Security Act which deal with services for maternal and child health, services for crippled children, and child welfare services are administered by the Children's Bureau of the U. S. Department of Labor. The Children's Bureau, for the administration of this portion of the Social Security Act, has organized three new divisions; namely, the Division of Maternal and Child Health, under the direction of a physician; the Crippled Children's Division, also under the direction of a physician; and the Child Welfare Division, under the direction of a social worker. There is also a public-health nursing unit, under the direction of a consultant public-health nurse, which will assist the States in developing the various public-health nursing services as they affect the fields of maternal and child health and of crippled children. Working out from the central administrative office, and later probably from certain field offices, there is a field staff of physicians and social workers who act as consultants to the States, and to these there will soon be added a group of public health nurses. Of course the States will work out their own plans within the requirements of the Act, but the Children's Bureau will be glad to serve in the capacity of consultant both in developing and in carrying out the State plans.

The Social Security Act places emphasis on the extension of services to rural areas and areas suffering from severe economic distress. The facilities for crippled children commonly found in larger cities are, as a rule, almost completely lacking in rural areas. The Act should, therefore, make it increasingly possible to extend these benefits to inaccessible areas and to groups in special need.

Under the provisions of the Social Security Act an annual appropriation of $3,800,000 is authorized for the purpose of enabling the States to extend and improve services for maternal and child health, $2,850,000 for the purpose of enabling the States to extend and improve services for crippled children and $1,500,000 for the purpose of enabling the States to establish, extend and strengthen child welfare services.

Further information regarding the details of these services may be obtained by requesting Maternal and Child Welfare Bulletin No. 1 from the Children's Bureau of the U. S. Department of Labor.

In addition to administration by a State agency, plans for both maternal and child health services and services for crippled children must show financial participation by the State itself, that is, use of State funds as distinguished from funds made available by local political subdivisions. The State agency charged with these services must provide for such methods of administration (other than those relating to selection, tenure of office, and compensation of personnel) as are necessary for the efficient operation of the plan, and make such reports as the Secretary of Labor may from time to time require. The State agency must also provide for cooperation with medical, health, nursing, and welfare groups, and in the program for crippled children cooperation must also be shown with any agency providing vocational rehabilitation for handicapped children. In the plan of services for crippled children there must be definite provision for carrying out the purposes stated in the Act; namely, extending and improving (especially in rural areas and in the areas suffering from extreme economic distress) services for locating crippled children; providing medical, surgical, corrective, and other services; and facilities for diagnosis, hospitalization, and aftercare for children who are crippled or who are suffering from conditions which lead to crippling.

One year ago in many States and Territories no officially recognized agency had been established for rendering services for crippled children as a public responsibility. In others which had official agencies funds appropriated for the purpose were so small as to be almost negligible. In contrast the situation on May 1, 1936, points to a tremendously increased interest in all programs of this nature. Official agencies have been established in 15 States during the past year to the point where there are now 43 States and Territories with recognized official agencies and there is prospect of several more in the near future. At present, 38 States and Alaska have submitted plans to the Children's Bureau, 29 of which have been approved. Information which we have indicates that several other States will be able to start operations with approved plans before the end of the Federal fiscal year on June 30.

Some features shown in a majority of the State plans approved to date have been:

1. The extension and strengthening of local services to insure the development of a State-wide program.
2. The recognition by the States of the public responsibility for services for crippled children whose parents are unable to provide adequate care.
3. The formation of general advisory committees with technical sub-committees which have included the various interested professional and lay groups.

Director, Crippled Children's Division, Children's Bureau, Department of Labor, Washington, D. C.

*Read at the 15th Annual Convention, International Society for Crippled Children. Reprinted from Crippled Child, June, 1936.

4. The development of cooperation and working agreements between public and private agencies which will provide for:
   a. Reporting activities
   b. Extending work through deposit of private funds to the credit of the official State agency.
   c. Educating and providing facilities for rehabilitation
   d. Transporting of crippled children to and from hospitals and clinics.

A special note should be made of the last item. By cooperative arrangements between those interested in crippled children and organizations and individuals with transportation facilities, the provisions for the care of crippled children have been immeasurably increased. This alone is a program which taxes ingenuity, stimulates interest, and insures more adequate care for greater numbers of children. Let us hope that with the advent of Federal aid and renewed interest of the States the contribution of private organizations for transportation shall not lessen but increase.

In a few instances where programs are starting for the first time surveys for locating crippled children are planned. A majority of the States have sufficiently extensive case records and large hospital waiting lists which make additional surveys at this time inadvisable. The newly organized agencies have profited by the experience of those States with long established services.

The problems of personnel have received careful consideration in connection with the development of State plans. Nationally recognized agencies have been called upon for information. Some States have been slow to employ workers unless their qualifications for work of this nature could be clearly established. As programs develop and opportunities for training personnel afforded by the State plans are utilized the qualifications of those in active charge of the programs should be further improved.

In reviewing the State plans it has been interesting to note the variation in the type of plan proposed and approved for operation. While most of them include features enumerated above there has been sufficient variety to provide a wide basis of experience for the future.

Adjustments in already established methods of administration or in type of plan have in many instances been necessary to allow the States to participate in the services under the Act. In these adjustments private organizations have been of great assistance. This has required a spirit of team-play and self-effacement which testifies in a very practical way to the high ideals held by them. These organizations, by establishing and carrying on programs for crippled children over a number of years, have developed a fund of experience which has proved invaluable to official agencies in starting the State programs.

With the advent of official participation let us hope that the cooperation of these groups will increase and that the work of official agencies can be both complementary and supplementary to that already established and operating under private control. In no way should the Federal program be considered as a substitute for already existing services.

The success of a program for crippled children will depend on the spirit of cooperation of all the interested agencies—local, State, and Federal with public and private organizations of both lay and professional groups and upon the skill and wisdom with which the efforts of these groups can be woven into a harmonious and well-balanced plan. The Children's Bureau should and will assist in promoting this coordination. Already in some States we have seen this brought about directly through the organization of an official State agency which unites the different groups. This unification will require teamwork from doctors, nurses, clinics, hospitals, social workers and private organizations. In order that all the contemplated benefits may be assured to every handicapped child careful consideration should be given by the official agencies to the standards of personnel, facilities, and administrative policies.

For the proper functioning of a good program for the care of crippled children, it is most essential to have professional groups advising on the technical phases of the work. Such a committee might well be composed of orthopaedic surgeons, pediatricians, public-health nurses trained in orthopaedic nursing, and social workers. This committee should serve in an active advisory capacity, meeting regularly with the official State agency.

The Children's Bureau has followed this procedure in appointing a general advisory committee on maternal and child welfare and a special technical committee on each of the three special phases of the program; namely, maternal and child health services, services for crippled children, and child welfare services. Other special committees will meet from time to time, such as a committee on maternal welfare, one on training of personnel for the crippled children's program, and one on hospital care for crippled children. This arrangement has worked in a highly satisfactory manner as it has allowed us to draw on the experience of a large group through their technically qualified representatives, who have given us invaluable recommendations and guidance in this new venture from a Federal point of view. We trust that the use of such advisory committees will prove equally satisfactory to the State agencies.

As the program develops it is hoped that the Children's Bureau may act as an official clearing house for information on all the problems involved in the care of crippled children. Through studies of methods of administration developed by the various types of programs data on many items heretofore unavailable should be made readily accessible to all groups.

Among activities planned for the near future are meetings of the general and technical advisory committees on the problems of personnel standards and hospital care and regional conferences at strategic points throughout the country with the personnel in active charge of State programs. We also plan studies of the use of convalescent homes in order to provide increased hospital facilities for children needing care, an evaluation of the methods for extending diagnostic clinics to keep pace with hospitalization and aftercare, and for increasing cooperation with lay and professional groups.

Working together in a common cause may we look forward to the time when prevention will be the major item in a program of services for crippled children and waiting lists shall be a relic of the past.

Abdominal Fascial Transplants

E. L. Lowman, M. D.

Weakened musculature in the extremities can be given fixed physiological rest by means of splints, but in the case of the abdominal wall (even when the body is in a cast), this can only be accomplished by running fascial bands to bridge over the weakened areas. By this means, improvement in gait, and balance in standing and sitting may be obtained; ability to bend and turn readily, and to transmit power from upper trunk to pelvis notably increased.

The prevention of contracture and shortening of those sections of the abdominal musculature still remaining viable because of the stretching of the weakened or paralyzed portion which connect them to pelvis or thorax is definite. Likewise, the harnessing of active sections by these fascial tendons to fixed points allows weakened pathways to take up slack and obtain a come-back.

Aside from the mechanical improvement obtained by this means, nearly all patients who have had abdominal wall transplants show some betterment of physiological function, due largely to restoration of abdominal wall resistance to the downward thrust of the diaphragm. Intra-abdominal pressure being thereby increased, an increase of blood and lymph is forced from this area onward. Repair has been made of the pump, which requires the resistance of a compresion wall, against which the active member—plunger or diaphragm—may act.

Up to May 1st, 1936, we have made fascial plastic operations on thirty-five patients—fourteen male and twenty-one female. Thirty were in poliomyelitis cases—in twenty-three different locations—most of which were in the abdominal wall. Six were in cases of scoliosis; three consisted of fascial straps run from right scapula to the upper lumbar spine to hold back the scapula. In another three, the implant was from the concave side of the lumbar spine to act as a tether to the ilium of the same side. In one case, a strap from the anterior spine to greater trochanter successfully corrected a marked outward rotation of the leg due to over-action of the external rotators. In a case of paralysis of rhomboids, a fascial string from one scapula to the other at the level of the spines gave sufficient fixation to enable the patient to raise arms to the vertical, while prior to operation she could abduct only to fifty degrees.

These transplants have usually been done as tendinous extensions from muscle to bone, but sometimes from bone to bone, more in the nature of ligamentous checks. When placed in the abdominal wall as a tendon, the work load should be graded so that there is a gradual increase in the stability of both muscular and bony attachments, and so that the insert is allowed time in which to enlarge.

This enlargement was proven in an interesting manner in one case in which we re-operated in order to release adhesions in the regions of Pouparts ligament, from around the insert that was run from the upper rectus and obliques down into the leg. We found that in a year's time, the thin flat strip of fascia transplanted had been transformed into a thick, rounded, heavy tendon.

Since the presentation of our first paper on fascial transplants in Toronto in 1932, several clinics have been making these fascial plastic repairs in types of cases previously not operated. Dr. George Bennett of Johns Hopkins, Dr. Leo Mayer of New York, and Dr. Frank Dickson of Kansas City have made notable contributions to this procedure.

Conclusion: Our experience, now confirmed by other clinicians, has shown this procedure to be sound, safe and trustworthy, especially in regaining trunk stabilization in abdominal wall paralysis. Care and judgment, of course, must be used in the selection of cases, and particularly in deciding on the proper location of the fascial inserts.

Read at the annual meeting of the American Physiotherapy Association, Los Angeles, California, June 30, 1936.

ANNOUNCEMENT

FIFTEENTH ANNUAL SESSION AMERICAN CONGRESS OF PHYSICAL THERAPY

Announcement is made of the 15th annual clinical and scientific session of the American Congress of Physical Therapy, September 7, 8, 9, 10 and 11, at the Waldorf-Astoria, New York City. The program includes many special features: sectional meetings in the specialties, symposia on short wave diathermy, hydrotherapy, exercise and electroresection. Fever therapy and the treatment of vascular diseases occupy an important place and will be discussed by prominent workers in the field. The educational aspects of physical therapy and the relationship of physical therapy technicians to physicians and hospital departments will be thoroughly dealt with. Other features include technical and scientific exhibits and a full day of hospital clinics where technic will be adequately demonstrated.

Physicians, their technical assistants, and nurses working in institutional departments of physical therapy are urged to attend this important session. It undoubtedly will be one of the outstanding medical gatherings of the year. There will be no registration fee.

The Physiotherapy Review

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It is with great regret that we announce the resignation of Miss Ida May Hazenhyer as Editor-in-Chief of the Review. It is a loss we feel keenly for the service she has rendered cannot be measured. The new Staff humbly asks the continued cooperation of the Chapters and the Members-at-Large. Let us continue throughout this next year with more of the fine papers submitted during this past year. Our goal is increased circulation and only by making it worthwhile will this be accomplished.

The Fifteenth Annual Convention

Through the scenic California countryside with its orange groves and palm trees, large double-deck buses provided transportation to the lovely Padua Hills, Claremont, California, Sunday afternoon, June 28. There, the American Physiotherapy Association was royally welcomed by the Hostess Chapter, Southern California. Amid authentic, colorful, Mexican music, song and dance, the friendly spirit which prevailed throughout the entire session had its beginning. Mrs. Gladdes Neff, mistress of ceremonies, skillfully and wittily conducted the Brag Supper. The Chapters tried valiantly to outdo one another but, believe it or not, no prize could be awarded! The mythical prize, however, could have been awarded by unanimous consent to Alice Gilson, Physical Therapist, Shriners' Hospital, Honolulu, who, in native costume, beautifully interpreted some of the lovely songs and folk dances of the Islands. The evening was a delightful departure from the conventional registration tea.

The first business session on Monday morning was opened with greetings from Emma Hansen, President of the Southern California Chapter. Sarah U. Colby then presided and addressed the Convention. Committee reports and election of officers followed. President, Constance Greene; First Vice President, Dorothy Frederickson; Second Vice President, Winifred Tougas Willard; Treasurer, Cecelia Leverone; Secretary, Edith Munro; Directors: Sarah U. Colby, Gertrude Beard, Marguerite Irvine.

At a later business meeting, revision of the By-Laws was found necessary. These appear elsewhere in this issue. An explanation of the amendments concerning membership is given in the Report of the Membership Committee. A change in the Standing Committees was also made, particularly to facilitate the work of the Committee on Education. It was felt that a Committee consisting of an appointed chairman and of the chairmen on the chapters was large, unwieldy, and not practical. Close association and exchange of information is necessary but, all matters concerning policy should be submitted only to the Executive Committee.

The Social Security Act as it affected crippled children was discussed. No action was taken except to recommend further study of the Act. A reprint of an address given at the Fifteenth Annual Convention of the International Society for Crippled Children by Robert C. Hood, M. D., Director, Crippled Children's Division, Children's Bureau, Department of Labor, is in this issue of the Review.

A salary survey was suggested. Many requests have been received inquiring about the average salary paid to a Physical Therapist. It would seem advisable to have such a survey to assist our members in obtaining an adequate return for their services. The suggestion was given to the Executive Committee to act upon.

An afternoon was reserved for viewing the exceptionally fine scientific and commercial exhibits. The large attendance proved the value of the exhibits and the appreciation of the members and others in being given time to study them. It is hoped that this policy will be continued.

The many splendid scientific papers given will be published in this and other issues of the Review.

Los Angeles is indeed fortunate in its hospitals and we were privileged to attend demonstrations and meetings at the Orthopedic, Children's and County Hospitals. At the Orthopedic a "Pool Demonstration" by Susan G. Roen and the Department Staff opened the program. Keen interest was shown in the technique used on the different cases. The "Seven League Boots" worn provoked much comment, particularly after the "Report of the Study of the Effect of the Pool on Technicians" was given by Dr. Carroll. It is gratifying to note that some thought is given to the Technician. Dr. Lowman demonstrated a group of cases with Abdominal Fascial Transplants. Opportunity was also given a limited number to observe Dr. Lowman perform one of these transplants. It was a revelation to feel and observe the rope-like quality and the strength of the fascia on a patient with a complete paralysis of the muscles of the abdomen and lower extremities as a result of a fractured spine.

The Children's Hospital provided a fine program by members of its Staff. Dr. Stewart gave us some unusual facts about the "Evolution of Muscular Physiology." A "Body Mechanic's Demonstration" was presented by Dr. Thompson in a very graphic manner. A series of lantern slides showed the posture before treatment and the children themselves exhibited the truly excellent results. Dr. Happ's paper "The Use of Physical Therapy in Pediatrics" appears elsewhere in this issue of the Review. The Children's Hospital Physiotherapy Alumnae Association was our hostess at a delightful tea in the Nurses' residence. To the strains of a romantic Mexican string quartette, we sipped tea, munched on delicious sandwiches, renewed old and made new friendships.

The new County Hospital was the last, but not least of the hospitals which we visited, a beautiful, imposing and awe-inspiring building. Mr. Olson, Assistant Su-

perintendent, welcomed us most cordially. A fine paper, "Nerve Injuries," by Dr. Adelstein followed. Opportunity was then given to see the very latest in Physical Therapy Departments where over three hundred treatments a day are given.

The banquet this year was a particularly gay affair, a fiesta, and held in the Fiesta Room at the Ambassador Hotel. "Mental Maturation" sounded a bit terrifying but to our surprise and delight, Dr. Woellner told us about our minds growing up in his inimitable and entertaining manner. It was the most stimulating tonic we could have had in the midst of our serious program. Harrassed expressions disappeared, not to return for that would be admitting you were not mentally mature!

The keynote for the rest of the Convention had been sounded. It was not all work and time was found to see the many interesting, glamorous sights of Los Angeles, Hollywood and Beverly Hills.

A signal honor was conferred upon us by the Los Angeles Breakfast Club. We were the first organization to receive an invitation to one of their weekly meetings, held in the famous Coconut Grove. During the breakfast there was a lively program with none other than Maurice Costello among the guests of honor.

A trip to the Huntington Library and Art Gallery in Pasadena will live long with those privileged to take it. The institution comprises three principal divisions, the Library, the Art Gallery and the Botanical Gardens. Time did not permit us to have more than a brief view of it all but no visit to California would be complete without it.

True to California tradition the registration was the largest we have ever had. The newspapers gave us more space, not to mention the article in Time magazine.

It is not that the king is dead, long live the king, but to our former Executive Committee we wish to express our appreciation of their tireless service to the Association. To the new Executive Committee we extend our congratulations and pledge of cooperation.

Many of the members continued on to San Francisco and Seattle. Cordial invitations were issued by those Chapters and an enviable time awaited the travelers.

Great praise and laurels must be awarded to Catherine Worthingham, National Chairman, Emma Hansen, Local Chairman and the Hostess Chapter, Southern California. They were tireless in their efforts to provide us with not only a fine scientific program, but with entertainment, good fellowship and cheer. The Fifteenth Annual Convention will go down in the annals as the best ever.

Address of President

Before us lies a busy, happy week. A week of conference, of inspiration, and of sociability. A week in which to discuss our problems and arrive at satisfactory conclusions; a week of inspiration where mind, body, and spirit are refreshed; a week of sociability where friendships of years gone by are renewed and new friendships are formed—all important assets to our profession; all contribute to our efficiency. It is our sincere hope that the memory of this week will come to you throughout the coming year as one of opportunity.

A year has passed, a year which is, itself, a memory. A year of work well done, of problems solved and of problems raised, of unexpected sorrows and of unexpected joys, a year of life, each of us here with her own memories comes to strengthen her spirit by a common experience.

The term of service of your present officers is coming to a close. They have been busy, interesting years. As executive officers we were congratulating ourselves that no vital problems had arisen, in fact we were feeling rather smug, when our composure was completely shattered by the final and definite resignation of our Review editor, Miss Hazenheyer. She had expressed a desire to be relieved of the work last year but we had persuaded her to continue through the year. She very generously, though reluctantly, consented. The importance of the Review in our association is hard to estimate. It is what the blood vessels are to the heart. Without it our association would die. Its high standard and quality have done more to place us among the first ranks of scientific associations and to establish our high ideals than any other one thing. Miss Hazenheyer is largely responsible for developing and maintaining this high standard. When I tell you that this year she has not only been editor of the Review but she has completed and received her Master's degree you will understand something of the strain she has been under. It is quite impossible to express our appreciation for all she had done for the association. We regret her resignation from the editorial staff, but we rejoice with her in her freedom for other interests, which she has truly earned. Action had to be taken. The Review must go on and its high standard maintained. Our Board of Directors has selected one who will continue the policies of the Review and continue its advance. Our new editor, conscious of the long hours of work she is assuming, has consented to accept the office. I am happy to tell you of our good fortune and to introduce our new editor, Miss Mildred Elson.

Tradition directs, and I follow. At this time it is customary to make a few suggestions. "If to do were as easy as to know what were good to do, chapels had been churches, and poor men's cottages princes' palaces," yet these suggestions I make with profound sincerity and after much thought, however, I offer them merely as suggestions for your consideration.

First, we are not a large organization, we are not a political organization, nor, fortunately, do we countenance politics among our members. Our officers are nominated in different sections of the country in order that each locality may be brought into active participation of the responsibilities and opportunities of the national executive work. My question is, why have two tickets? To some of you that may seem rather radical, but if you think it through you will realize that much is said each year of the "turn" of this or that section to have the national officers. In recent elections one ticket has usually cast its influence for the other in order that the opportunity for service may be given to a certain section that has not recently been represented. In planning two tickets, as at present, each has upon it a group of fine women in whom we have confidence. Why not reserve one group for another time? While I believe we should outline our own policies I do believe the American Nurses' Association has set a splendid example in this respect. Perhaps you are saying politics will creep in, that is not possible with a board of directors and with the opportunity of nominations from the floor. I recommend this suggestion for your consideration throughout the year.

My second suggestion is really the suggestion of our membership chairman so I will only mention it, she will explain it later. It is this, in order that our standards

for membership may be maintained at the same level all applications should be submitted to the national membership chairman for action by the executive committee. Miss Grunewald will state her proposition more definitely in connection with her report.

My third suggestion is that some plan be devised whereby each chapter may be visited, officially, by one of the national officers or a representative of the national officers. This visit should be for council, advice and sociability, a tying together of all the chapters. I feel very strongly that the time has come when plans should be made for presenting the work of the association directly to the members of each chapter and bringing back to the national group the problems peculiar to each chapter. Only "in unity there is strength." Whether this responsibility be assigned definitely, to the various members of the board of directors, or what organization would be evolved is a matter for careful consideration, but the need is definite.

And fourth, members at large. How are we to make them feel the pulse beat of the organization? How are they to feel a part of its activities? How can they best serve their profession through the association? Should they be organized in a chapter-at-large with a secretary to represent them and through whom they may be contacted? Suggestions of this kind have been made during the past two years. The opinion of the association body and particularly of some of the members at large who are present would be very helpful.

To Dr. Lowman, President of our Board of Advisors we extend our deep appreciation for his advice and guidance over difficult places. The way has been comparatively smooth, officially, but there have been enough problems to make the scenery interesting en route.

Our association is receiving and will continue to receive, recognition among scientific groups. It is our responsibility and privilege to so work together that the American Physiotherapy Association will be reverenced because of the character of its workers and its work.

SARAH U. COLBY.

Report of Executive Committee

Meetings: Ten Special and two Regular meetings.

Time	Kind	Place	Number Present
June, 1935	Regular	Atlantic City	9
Sept. 14	Special	Los Angeles	4
Nov. 9	Special	Los Angeles	5
Dec. 7	Special	Los Angeles	4
Dec. 28-29	Regular	Laguna Beach	6
Feb. 1	Special	Los Angeles	5
March 26	Special	Los Angeles	4
April 2	Special	Los Angeles	4
April 23	Special	Los Angeles	4
May 28	Special	Los Angeles	4
June 8	Special	Los Angeles	4
June 15	Special	Los Angeles	4

At the regular mid-year Executive Committee meeting, Marie Fackt of Denver, Colorado, was chosen to represent the Directors and complete the quorum for the meeting.

CHAPTER LETTERS

During the year three Chapter Letters were sent out, the first in September, the second in January, and the third in May. As a method of checking on whether or not these letters containing instructions have been read by the chapter officers, we have requested the coupon attached to the end of the letter be signed by the Chapter President and Secretary and returned to the National Secretary. Ten chapters signed and returned coupon on September Letter. Fourteen chapters signed and returned coupon on January Letter. No request was made on the May Letter.

MEMBERSHIP

The national membership as of May first is as follows:

Active Members—		
Members-at-large	181	
Chapter Members	529	710
Affiliated Members—		
Honorary Members		
Associate Members		
Junior Members		
Total Membership		

A full report on membership will be given by the Membership Chairman.

MEMBERSHIP REQUIREMENTS

Because it was found at the Atlantic City Meeting that some of the chapters had not been following the Constitutional requirements and National Executive regulations in accepting new members, the National Membership Chairman was instructed to send immediately to all chapters lists of schools from which members are acceptable and instructions on the routine of membership applications so that there would be no further excuse this year for the chapters accepting members who do not meet Constitutional requirements.

SCHOOLS AND COURSES

At the Atlantic City meeting it was voted to continue the use of the list of schools of the previous year with the addition of Walter Reed Hospital (whose course had been temporarily discontinued) until such time as the American Medical Association had completed its survey and made its report. At the time of writing, this report of the American Medical Association had not been received.

EXAMINATIONS

Seven desirable applicants with irregular training were approved as candidates to take the examination for membership and paid the fee. Five took the examination in various sections of the country during February and March. Of these, four passed and one failed. Examination of the other candidates had to be delayed because of illness of the candidates.

MEMBERSHIP ROSTER

Upon the recommendation of the Editor of the Physiotherapy Review, it was voted to omit the list of membership from the Review and print it as a separate booklet. Business firms had been buying copies of the Review containing the membership list to use for advertising purposes instead of buying advertising space in the Review. You will note that the present position of some members was given and omitted on others for whom we had no information available.

PERSONAL QUESTIONNAIRES

Only 376 questionnaires have been returned for national files (about one-half of the membership). We want once more to urge your cooperation in this matter. Many members have joined the Association through chapters and there is no information in the national files as to the background and valuable experience of these members. Such information regarding Association

members is of great value to the National Officers in many instances, such as selecting members in certain localities to give examinations, serve on committees, and for other appointments. They are of assistance to the Nominating Committee in selecting candidates for office, to the Secretary in selecting candidates for certain available positions with special required experience.

CHAPTER CONSTITUTIONS

At the Cleveland Convention two years ago the Constitution and By-Laws of the National Association were revised. The chapters have been asked to revise their chapter constitutions to conform to that of the National. To date just seven chapters have complied with the request. All of those sent in have been approved.

OHIO CHAPTER

Cleveland Chapter representatives appeared before the Executive Committee at the Atlantic City meeting requesting approval of their plan to reorganize forming a state chapter to be known as the Ohio Chapter with Cleveland and Columbus as districts of the state chapter. Approval was given and the reorganization was completed in October, 1935.

EXHIBITS

The National Association has had exhibits at the following conventions:

(1) Convention of the Congress of Physical Therapy at Kansas City in September, 1935.

(2) American Medical Association Convention at Kansas City in May, 1936 (Scientific exhibit space).

The Association owes an expression of appreciation to Catherine Worthingham for her time and effort in preparing both of these exhibits which are being shown at our present meeting.

An invitation to exhibit in the Medical Science Building of the California Pacific International Exposition was accepted by the Association in February. It was decided to send at once the exhibit used at the American Medical Association National Convention in Atlantic City as it had already been approved by the American Medical Association. The plans were to change the exhibit at a later date to include photographs demonstrating the various types of physiotherapy treatments. The exhibit was shipped as per telegraphic instructions of the Director. For some unknown reason the exhibit has not been used and the fact was not discovered until several weeks later when two of the Committee visited the San Diego Fair to change the exhibit. The Director now says that they only have room for a show case exhibit.

CONVENTION

The usual practice of holding our National Convention at the same time and place as that of the American Medical Association was impractical this year as there is not a chapter in Kansas City to arrange the convention details for us. As a standing invitation from the Southern California Chapter to hold a convention in Los Angeles had been extended at the Cleveland Convention and the officers are all Californians living near Los Angeles, Los Angeles won without a contest.

NOMINATING COMMITTEE

The President appointed the following as members of the Nominating Committee: Marie Fackt, Denver, Chairman; Jessie L. Stevenson, Chicago; Edith Monro, Boston.

REVIEW

The year began with Gertrude Beard as Business Manager of the Review to succeed Martha Hindman who resigned. In April this year, Miss Ida M. Hazenhyer resigned as Editor stating that Miss Marguerite Svebilius had agreed to edit the May-June issue of the magazine. Miss Hazenhyer's resignation was a blow, and the present committee are deeply grateful to her for carrying on under protest for as long as she did.

In May the resignation of Gertrude Beard was received. We are very happy to report to the incoming committee that Mildred Elson has accepted the appointment as Editor of the Review.

APPOINTMENT SERVICE

During this past year forty (40) members have applied to this office for positions. Thirty (30) openings were referred to us to be filled. Sixty-six (66) recommendations were made to fill these openings. So far as we know only seven (7) of these positions were filled through the efforts of this office. Six (6) members obtained employment through other sources. Twenty-two (22) members are still on the list for positions. It is the old, old story; the members rarely inform us as to whether or not they apply for the position and whether or not they accept when recommended.

The National Executive Committee wishes to express its appreciation to those members who have served on standing and special committees.

The officers wish to express their appreciation of the splendid cooperation given them by the National Director this year.

We also wish to extend our thanks to the chapters for their assistance in carrying out the mandates of our Constitution and By-Laws. We urge you to continue to give your loyal support to the incoming officers.

Respectfully submitted,

JEFFERSON I. BROWN, Secretary.

Annual Report of the Editor

At the close of the year 1934-35, Martha Hindman was forced, due to the pressure of her own affairs, to give up the business managership of the REVIEW, and during the convention at Atlantic City, Gertrude Beard, former business manager, was asked to take the office. Miss Hindman remained on the staff as an associate editor.

The editor's report, at that time, contained a plea for some arrangement whereby the work of the journal might be carried on more efficiently than was theretofore possible, with the editorial and business offices separated by some distance. A new plan was formulated at the convention, and the Review staff was instructed to establish one central office in Chicago where the editor and business manager and printer could work together. The plan was carried out, and a part time secretary was employed for the detail work of the office. While the situation is not yet perfect, it is an improvement over the former one, and we, working here in Chicago, feel more than ever, that the central office plan is an excellent one. It is one which can make the work of the Review more and more efficient, and the resulting journal a greater credit to the Association.

During the past year, the six issues of the Review were prepared as usual and each went into the mails at the usual time. The May-June number, however, was a little delayed, awaiting final convention news. Almost all of the chapters made their customary contributions

to the issues for which they were responsible; and, in addition, many articles came to the editorial office directly from the contributors who offered their papers for publication. It is most gratifying to receive these voluntary contributions from well-known writers who are willing to have their work appear in our pages. The editorial staff expresses its appreciation to these, and to the authors whose articles have been solicited by the chapters.

Throughout the year, care has been exercised in the publication of the copy coming into the office. Only such materials and authors as were deemed of proper professional standards and recognized ethics, were accepted. If the vigilance seemed a bit severe in some cases, it was only because the staff was ambitious to maintain the professional standards of the Association.

With the writing of this report, my work as editor of the Review comes to a close. Again, this last time, I send out my sincere thanks to all those who have helped make the journal as good as it is: to the executive committee which has stood behind the work; to the chapters giving their loyal support; to all the generous contributors; to Dr. Coulter who has continued the abstract column; and to my associates on the staff. This latter group has been most loyal, and throughout my term of three years, I have felt that I had a fine supporting body. The three associates have responded to every call, Miss Beard has taken excellent care of the business, and Miss Svebilius has been very generous in helping with the work of the May-June issue, especially.

It is only because of all the support behind the Review that I can turn over to my successor a journal of no mean merits. It is still in the making, however. There is yet much to be done in its pages, and there are always innovations to be introduced—without which no thing grows. I greet my successor, I extend to her my best wishes, and I offer my assistance.

Respectfully submitted,
IDA MAY HAZENHEYER.

Report of the Business Manager

The financial report of the Business office of the "Review" is included in the treasurer's report.

The statistical report from May 1st, 1935, to May 1st, 1936, is as follows:

Subscriptions entered	210
Extra copies sold	15
Advertisements run	53
Copies of reprints from articles in Review	5,000
Complimentary copies—including copies sent to: exchange journals, advertisers, contributors, advisory committee, honorary members, members of Council on Physical Therapy of The American Medical Association, prospective subscribers	472
Books sold	3

Shortly after assuming the work of Business Manager of the Review, we were distressed over the seemingly large number of complaints of failure to receive the magazine received from members and subscribers. We determined to attempt to rectify this situation and have analyzed the complaints in order to locate the source of inefficiency. During the year a total of 30 complaints was received. Of this number 13 or 43⅓% were due to errors on the part of the complainants. To itemize these:

Errors of complainants: No notice of change of address; Change of address too late to go on mailing list; Complaint received before issue was due; Non-payment of dues	13	43⅓%
Errors of printer	5	16⅔%
Errors of stenographer	6	20 %
Errors of postoffice	3	10 %
Miscellaneous errors	3	10 %

We regret the inconvenience which this has caused our readers and we are not wishing to offer excuses for the errors on the part of this office. As you realize, in the transfer of responsibility of any detail work from one individual to another, it is impossible to avoid some errors and inefficiency. We believe the centralization of executive and business offices of the Association in a permanent location will avoid many of these errors and make possible more efficient service to members and other subscribers.

As you note, the largest group of complaints of delivery was due to the member neglecting to report change of address. With the cooperation of chapter secretaries and members, many of these can be avoided. The Review is due to be in the mail on the 15th of the month of issue. Any change of address must be received by the Business office before the first of that month.

There has been an increase of nearly 20% in the subscription list the past year.

It is interesting to note the number of organizations and institutions on the subscription list. To summarize:

Hospitals	10%
Schools and Libraries	20%
Medical Societies, Visiting Nurse Associations and other organizations	10%
Doctors	10%
Other individual subscribers	40%

Twenty-five subscriptions and six exchanges are sent to foreign countries. The magazine is sent to sixteen different foreign countries.

We regret to report that there has been a slight decrease in the amount of advertising in the Review. The limited amount of acceptable material and the small circulation make this the most difficult problem of the business office. We again appeal to members to avail themselves of any opportunity to personally contact firms whose advertising is acceptable.

I wish to express my regret at the resignation of Miss Hazenhyer as Editor and my appreciation to her and all other members of the Review staff and to the Executive Committee for their loyal support during the past year.

Respectfully submitted,
GERTRUDE BEARD,
Business manager.

Report of the Treasurer

American Physiotherapy,
Los Angeles, California.

Ladies:

We have audited the accounts of the National Treasurer of the American Physiotherapy Association for the year May 1, 1935, to April 30, 1936, and have prepared therefrom and from the Revolving Fund Cash Book of the Physiotherapy Review the following attached exhibits:

Exhibit I Statement of Cash Receipts and Disbursements May 1, 1935, to April 30, 1936.

Exhibit II Physiotherapy Review — Revolving Fund May 1, 1935, to April 30, 1936.

Exhibit III Reconciliation of bank balance at April 30, 1936.

We have traced all recorded receipts into the bank account. We have examined cancelled checks, together with proper authorizations for all disbursements. We have checked the footings of the Cash Book and verified the bank balance. We are of the opinion that the following exhibits fairly and correctly reflect the financial transactions for the period stated.

Yours very truly,
JOHN A. SIMMERS & COMPANY.

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS
MAY 1, 1935 TO APRIL 30, 1936

RECEIPTS

Membership dues:		
Senior	$5,475.50	
Junior	239.00	
Associate	54.00	$5,768.50
Physiotherapy Review:		
Subscriptions	$ 530.11	
Sale of extra copies	8.00	
Illustrations and reprints	304.21	
Advertising	292.81	
Sale of Coulter's Book	7.50	1,142.63
Convention registration		140.00
Application fees		64.00
Examination fees		60.00
Sale of pins and emblems		152.12
Commercial exhibit space rent		12.50
Interest		59.66
Total		$7,399.41

DISBURSEMENTS

Auditing	$ 10.00	$ 30.00
Business secretary's salary		1,159.00
Committees' expenses:		
Educational	10.00	
Executive	189.04	
Publicity	30.85	229.89
Convention expense:		
Report on proceedings	$ 123.65	
Traveling and miscellaneous	1,312.42	1,436.07
Exhibits expenses		446.38
Physiotherapy Review:		
Advances to revolving fund—exhibit II	$ 116.91	
Coulter's Book	3.46	
Miscellaneous	13.59	
Printing and postage	1,672.64	
Stenographer	176.30	1,982.90
Pins and emblems		74.41
Postage		66.39
Printing, stationery and miscellaneous		155.28
Refunds:		
Dues	$ 6.00	
Pin	3.00	
Reprints	6.30	
Subscriptions	9.50	24.80
Returned check		3.00
		$5,608.12
Excess of receipts over disbursements		1,791.29
		$7,399.41

PHYSIOTHERAPY REVIEW—REVOLVING FUND
MAY 1, 1935 TO APRIL 30, 1936

Balance—deficit—at May 1, 1935		$ 10.33
Add:		
Received from National Treasurer—exhibit I	$116.91	
Received from Editor's Petty Cash Fund	5.95	122.86
		$112.53
Deduct:		
Disbursements:		
Editor's expense	$ 8.00	
Miscellaneous	1.13	
Postage	85.05	
Printing, stationery and supplies	8.41	
Stenographer	12.50	115.09
Balance—deficit—at April 30, 1936		$ 2.56
As follows:		
Due to Miss M. Hindman	$ 4.90	
Cash in hand—Miss G. Beard	2.34	2.56

SYNOPSIS OF COLLECTIONS FOR PHYSIOTHERAPY REVIEW

Collected by Business Manager and remitted to National Treasurer	$1,093.90
Add: Remittance in transit April 30, 1935	25.50
	$1,119.40
Deduct: Remittance in transit April 30, 1936	30.50
	$1,088.90
Received by National Treasurer direct	53.73
Per exhibit I	$1,142.63

RECONCILIATION OF BANK BALANCE
APRIL 30, 1936

Commercial account—Security-First National Bank of Los Angeles.		
Balance per bank statement, April 30, 1936		$3,252.86
Deduct:		
Checks outstanding at April 30, 1936:		
Number 348	Amount $53.13	
349	7.21	
350	28.00	88.34
Balance per books, April 30, 1936		$3,164.52
Savings account—Security First National Bank of Los Angeles.		
Balance May 1, 1935—Account No. 11746	$2,637.04	
Add:		
Transfer from Commercial Account	$2,000.00	
Interest to December 31, 1935	59.66	
Balance April 30, 1936		4,696.70
Total Balance at April 30, 1936		$7,861.22

RECONCILIATION

Balance May 1, 1935	$6,069.93	
Add:		
Excess of Receipts over Disbursements—exhibit I	1,791.29	7,861.22

Respectfully submitted,
SUSAN G. ROEN.

Education Committee Report

It is with great pleasure that we are able to give you the report of the Council on Medical Education as presented to the House of Delegates at the Kansas City Session of the American Medical Association by Dr. William Cutter. This report was published in the May 23rd issue of the Journal of the American Medical Association, Supplement A, and Essentials of an Acceptable School for Physical Therapy Technicians as follows:

Supplement A. Schools for Physical Therapy Technicians.

The preliminary study of schools for physical therapy technicians by the Council on Medical Education and Hospitals, authorized by the House of Delegates during the annual convention of the American Medical Association at Cleveland, June 11-15, 1934, has been completed.

Thirty-seven schools were included in the survey. After carefully studying the inspection reports and securing the opinions of the Council on Physical Therapy, the American Congress on Physical Therapy

and the American Physiotherapy Association, the following essentials are proposed:

ESSENTIALS OF AN ACCEPTABLE SCHOOL FOR PHYSICAL THERAPY TECHNICIANS

I. Organization

1. A school for physical therapy technicians should be incorporated as or under a nonprofit institution. Its board of trustees should be composed of public spirited men or women having no financial interest in the operations of the school. The trustees should serve for fairly long and overlapping terms. If the choice of trustees is vested in any other body than the board itself, that fact should be clearly stated. Officers and faculty of the school should be appointed by the Board.

2. Affiliation with a college, university or medical school is highly desirable but is not an absolute requirement.

II. Faculty

3. The school should have a competent teaching staff, graded and organized by departments. Appointments should be based on thorough education and training and successful teaching experience. Nominations for faculty positions should be made in accordance with academic custom. The staff should include not less than one qualified physical therapist. The question of full time and part time appointments is not as important as the qualifications of the instructors, who should be specialists or exceptionally well trained and well qualified in the lines they are teaching.

III. Plant

4. The school should own, or enjoy the use of, buildings sufficient in size to provide adequate lecture rooms, class laboratories and administration offices. Adequate equipment should include anatomic charts, manikins, models, stereopticons, and other aids to effective teaching. It is suggested that dissecting materials should be provided to enable each student to dissect or have the benefit of demonstration of dissection of at least the lateral half of the human cadaver. Skeletons and disarticulated bones should be supplied. There should be a library receiving regularly all the scientific periodicals pertaining to physical therapy, current numbers of which should be easily accessible to the students.

IV. Clinical Facilities

5. Provision should be made for each student to receive practice training adequate in kind and amount under competent supervision in physical therapy in a hospital or other institution acceptable to the Council on Medical Education and Hospitals of the American Medical Association.

V. Resources

6. Experience has shown that a modern school of physical therapy cannot as a rule be maintained by the income from students' fees. No physical therapy school, therefore, should expect to secure approval which does not have a substantial income in addition to students' fees.

VI. Administration

7. There should be careful and intelligent supervision of the entire school by an executive officer who, by training and experience, is fitted to interpret the prevailing standards in physical therapy education, and who is clothed with sufficient authority to carry them into effect.

8. There should be satisfactory records, showing conveniently and in detail the credentials, attendance, grades, and accounts of the students, by means of which an exact knowledge can be obtained regarding each student's work. Except for good cause, such as for illness, no credit should be given for any course when the attendance has been less than 90 per cent of the full time.

VII. Requirements for Admission

9. Candidates for admission should be able to satisfy one of the following requirements:

(a) Two years or sixty semester hours of college, including courses in physics and biology.

(b) Graduation from an accredited school of nursing.

(c) Graduation from an accredited school of physical education.

Courses in general physics, chemistry and biology are highly recommended for all who seek to enter training in physical therapy.

10. The admission of students to the physical therapy school must be in the hands of a responsible committee or examiner, whose records shall always be open for inspection. Documentary evidence of the student's preliminary education should be obtained and kept on file. When the physical therapy school is an integral part of the university, this work usually devolves on the university examiner.

11. Advanced standing may be granted to students for work done in other acceptable physical therapy schools or hospital departments provided the entrance requirements and other essentials herein set forth have been complied with. Official verification of the student's previous physical therapy work should be obtained by direct correspondence with the schools previously attended, and his preliminary qualifications should also be verified and recorded the same as for first-year students.

VIII. Publications

12. The school should issue, at least annually, a bulletin setting forth the character of the work which it offers. Such announcement should contain a list of the members of the faculty with their respective qualifications.

IX. Minimum Curriculum

Subjects	Hours Theory	Hours Lab. and Practice Tr.
Anatomy (including applied anatomy, demonstration on cadaver and lecture)	210	
Clinical practice		400
Electrotherapy	30	45
Ethics and administration	5	
Hydrotherapy	5	15
Massage	15	45
Pathology	30	
Physiology	30	45
Principles of physical therapy as applied to		
Medicine	15	30
Neurology	10	15
Orthopedics	15	30
Surgery (including surgical observation)	15	30
Psychology	15	
Therapeutic exercise	30	75
Electives	45	
Total	470	730

Suggested electives: asepsis, bandaging, first aid, history of physical therapy, hygiene, joint measurements, office routine, occupational therapy, records, social service.

All subjects should be taught by qualified teachers.

Length of course: Not less than nine months.

We are indeed indebted to Dr. Cutter and his associates and to the Council on Physical Therapy for their untiring efforts to establish acceptable standards for Physical Therapy technicians.

There have been several conferences to which we were invited to attend. The spirit of cooperation was splendid and we feel that all of us will benefit by their recommendations and interest. It should be noted that the number of hours given for each subject is in a multiple of 15 and can therefore be readily changed into credit hours.

At some future date it is believed that a recommendation for the undergraduate course will be made specifically. At the present time the undergraduate course must include the minimum curriculum in addition to its own requirements for graduation.

Dr. Cutter at the present time is preparing a paper which he will publish in the Educational number of the Journal of the American Medical Association, August 29, 1936.

The annual examination for membership was conducted in February, 1936, by the following:

Elizabeth Grimm, Detroit, Michigan.
Helen Kaiser, Cleveland, Ohio.
Lois Rankin, Tucson, Arizona.
Mary Ramsey and Cora Howe, Indianapolis, Indiana
Gudrun Brask, Seattle, Washington.
Carolyn Brown, New Haven, Connecticut.
Gertrude Beard, Chicago, Illinois.

To them we are deeply grateful for their efforts and judgment for upon each rests much responsibility.

It is the opinion of the chairman, that we must be rigid on our examination that it not only cover technique but show adequate training in the biological sciences. There must be an equality between our examination and our requirements for membership.

It is also recommended that in the event of failure of the candidate to pass, and she applies to retake the examination, that she be required to average 85 in both the written and practical sections. Each year we continue to get an increased number of requests for information and advice concerning education. We believe that registration of all the schools will increase this fall.

We appreciate that there are still many problems to solve, but we feel that while we have moved forward slowly it has been progress. Larger fields are continually opening to physical therapy technicians, and we must be ready for them. We were fortunate to have an informal conference with Dr. Hood of the U. S. Department of Labor who is in charge of the Crippled Children's division under the Social Security Act. A conference with him, the Council of Education, and the Council on Physical Therapy is being planned.

I wish to express my appreciation to all the schools and hospitals offering courses in Physical Therapy, particularly during the last two years of the school survey. They have continued to maintain their high standard and have enabled us to use them as a yardstick. I wish also to express my gratitude to the executive committee for their helpful advice and cooperation at all times.

Chapter Reports

CHICAGO—Miss Gertrude Beard, Chairman.

Two evening courses were offered at Northwestern University School of Medicine.

1. Skeletal Muscle—15 hours—Dr. Herman Chor —Registration, 40.

2. Psychology of the Handicapped—30 hours—Dr. Herman Chor—Registration, 10.

OHIO—Miss Margaret Cleaveland, Chairman.

No particular education activity as they have been occupied with the organization of the Ohio chapter.

PENNSYLVANIA—Miss Blanche Sinn, Chairman.

Has had no definite education program. The committee however has been alert and active on matters concerning the members and in the activities of the Pennsylvania State Board of Medical Education and Licensure.

Respectfully submitted,
MILDRED ELSON, Chairman.

Report of the Membership Committee

Madam President:

As Chairman of the Membership Committee I wish to present my report for the year 1935-36.

This year we have had ninety-six new members join our ranks. This is almost again as many as last year. We have also had fifteen former members reinstated. Much to our satisfaction there were only five accepted applicants who did not complete their membership because of failure to pay dues. Last year only one half of the number of accepted applicants became members. This difference, we feel, is the result of the two dollar application fee which was required this year. The fee is not returnable but is applied to the dues if person is accepted as a member. This fee kept many who questioned their eligibility from applying which was a great saving of correspondence and in turn saved much time and postage. Only five applicants were rejected. Fourteen were given the privilege of becoming members by examination and of this number only seven took the examination and six passed.

At this time we wish to propose another measure which we believe will also save much time, energy, money and worry. The proposal is this: that all membership applications be acted upon by this National Membership Committee which is made up of the members of the Executive Committee. All applications which are irregular and questionable are now submitted to this committee. These are the ones that take the time. Those that are accepted by the chapters are regular and conform to the qualifications as stated in the By-Laws and are not much trouble. With a trained business secretary the recommendations can be obtained and all the data presented to the Executive Committee by the Membership Chairman with her recommendations. This procedure would insure uniformity and promptness and would be more businesslike. It would avoid the necessity of sending instructions to the chapters at each change of officers which always means much confusion, delay and often serious mistakes. It would also save the chapters much embarrassment and often antagonism or hard feelings with not only the applicant, a local physiotherapist, but also local physicians. Of course the Membership Chairman of the Executive Committee would expect and appreciate any information on a chapter applicant that would be helpful in determining eligibility and favorable qualifications. The Business Secretary would notify the applicant and Chapter Secretary of acceptance and on receipt of dues from the Chapter Secretary-treasurer a membership card signed by the National Treasurer would be sent without any delay.

We are pleased with the number of new members and the total membership which is fast approaching the seven hundred and fifty mark. However, we are more proud of the quality of the membership than of the number.

We hope that the Association will always maintain its high standards for membership and that every member, old and new, will uphold these standards and

ever consider it a privilege to belong to our American Physiotherapy Association.

Respectfully submitted,
LUCILE R. GRUNEWALD, Chairman.

Report of the Publicity Committee

The report of this committee is again, I am sorry to state, a rather meager one.

The publicity done by the various chapters comprises, generally, announcements of meetings and sectional conventions to members, and to newspapers and professional magazines, and planning exhibits when necessary. A few chapters have news letters for their own membership. More of these, especially where the membership is scattered, would be a great help.

Miss Catherine Worthingham planned an exhibit on "Feet," and took it to the American Medical Convention in Kansas City. It is in the Scientific Exhibit, as well as the one on "Body Mechanics" shown at the Medical Convention in Atlantic City last year.

The Scientific and Commercial Exhibits for our convention this year have occupied most of our time. Mrs. Broemser, of the Southern California Chapter, has managed the Scientific Exhibit, and has done an excellent piece of work. The responses for the Commercial Exhibit were slow, but after the American Medical Convention was over, and after some personal persuasion from various Southern California Chapter members, the commercial firms became more interested.

It would be a great help to the national publicity chairman, if she be notified of all new exhibits and professional motion pictures by the chapters, as many requests for information concerning these come from all parts of the country.

Respectfully submitted,
CATHERINE WALLACE, Chairman.

Report of the Legislative Committee

The Legislative Committee has contacted all Chapters for information concerning legislation related to Physical Therapy during the past year and has the following report to make.

Chapters reporting on legislation passed: District of Columbia, Northern California, Oregon, Pennsylvania, Texas, Western New York, Wisconsin.

Chicago—An attempt was made by the American Association of Physiotherapy and Hydrology to present a bill at Springfield, one inimical to the welfare of Physiotherapy in general.

As a result of the interest in legislation that is being manifested by other organizations the committee feels that we should assume leadership and draft a bill for Physiotherapy to be presented during the next session of our State Legislature.

Chapters not heard from: Central New York, Massachusetts, Michigan, Minnesota, New Jersey, New York, Ohio, Rhode Island, Southern California, Washington.

We regret that more Chapters did not report on the conditions of legislation. I will state, however, as we feel that no legislation is better than bad legislation, we are well satisfied with the reports received.

Respectfully submitted,
HAZEL E. FURSCOTT, Chairman.

Amendments to the By-Laws

Article II, Section 1, A, 1b: "60 college credit hours including physics, chemistry, biology and zoology," was stricken out. "60 college semester hours twenty-six of which shall include physics, chemistry and biological sciences," was substituted.

Article II, 1, A, 2 shall read as amended: "Chapter Membership shall be composed of all members of Chapters. All members of Chapters shall be members of the American Physiotherapy Association."

Article II, Section 1, A, 3, shall read as amended: "Membership-at-Large shall be composed of those members who are unable to take an active part in a Chapter."

Article II, Section 1, 4, shall read as amended: "Applications for Chapter Membership and Membership-at-Large shall be made to the Executive Committee to be voted upon at its meetings."

Article II, Section 1, 5, shall read as amended: "Candidates whose training and experience are considered by the Executive Committee to be equivalent to the requirements stated in Article II, Section 1, A, 1, or who satisfactorily pass an examination as provided for in these By-Laws, shall be eligible for Active Membership."

Article VII, Section 2, shall read as amended: "The Chairmen of these Standing Committees shall be appointed by the Executive Committee."

Article VII, Section 3a (3) shall be changed to read Article VII, Section 3a (4).

Article VII, Section 3a (3) shall be: "To promote an exchange of information between Chapters and Committee."

Article VII, Section 3b (3) shall be changed to read Article VII, Section 3b (4).

Article VII, Section 3b (3) shall be: "To promote an exchange of information between Chapters and Committee."

Scientific Exhibit American Physiotherapy Convention

Ambassador Hotel, Los Angeles, Calif.,
June 28 to July 2, 1936

Exhibitor—Santa Barbara Clinic.
Title—The Viscero-Spinal Syndrome and its Practical Application.
Description—Consists of plates and reading matter detailing the diagnosis and treatment of the viscero-spinal syndrome.
Exhibitor—Santa Barbara Cottage Hospital.
Title—Cottage Hospital Fever Therapy Device.
Description—Working model of the fever cabinet and explanatory charts.
Exhibitor—Wisconsin Chapter.
Title—Wisconsin Chapter Exhibit.
Description—15 posters—3 each on following subjects:

1. Hospitals for Adults.
2. Hospitals for Children.
3. The Homebound.
4. Clinics for Ambulatory Patients.
5. Orthopedic Schools.

Exhibitor—San Francisco Sunshine School.
Title—San Francisco Sunshine School.
Description—Pictures of School.
Exhibitor—Veterans Administration.
Title—Physiotherapy in Veterans Administration Hospitals.
Description—A wall hanging divided into 3 panels for each of the following:

1. Tuberculosis.
2. Neuropsychiatric.
3. Home Hospitals.

Exhibitor—Stanford University.
Title—Spinal Fleximeter.
Description—Apparatus for measuring the range of motion of the vertebral column. Can also be used to provide fixation and resistance in mobilizing exercises.
Exhibitor—Grasslands Hospital, Valhalla, N. Y.
Title—Apparatus and supports for infantile paralysis. Originated and used in Grasslands Hospital.
Description—Wooden model of leg splint and poster containing 5 photographs and one shoulder epaulet for corset.
Exhibitor—Dorothy Young, San Mateo, Calif.
Title—Subdeltoid Bursa with stones.
Description—Series of X-Rays showing case during diathermy treatments.
Exhibitor—Physical Therapy Department, University of California Hospital.
Title—Photographs of Pool.
Description—Photographs of apparatus demonstrating use of traction.
Exhibitor—Minnesota Chapter.
Description—A map of Minnesota descriptive of where work is being done by members of the chapter.
Exhibitor—Warm Springs Foundation.
Description—Hand splint for weak thumb. Canvas corset with shoulder attachments. Leg brace with additional hip stabilizing shop.
Exhibitor—Physical Therapy Department of Northwestern University Medical School.
Title—Heating of Tissue by Short Wave Diathermy.
Description—Posters showing graphs, results of experiment of work.
Exhibitor—Shriners' Hospital, Honolulu, T. H.
Title—A mechanical device for the reeducation of the plantar flexors of the foot.
Description:

1. Short outline of case report.
2. Small board and sandal.
3. Posters showing its application.

Exhibitor—Ohio Chapter.
Description—150 pamphlets regarding care and treatment of crippled children in Ohio, Also 150 pamphlets published by the State Board of Education regarding the education of crippled children in Ohio.
Exhibitor—American Physiotherapy Association.
Title—Body Mechanics.
Description—Posters and photographs showing reasons for, and aims of good body mechanics.
Exhibitor—American Physiotherapy Association.
Title—Feet.
Description—Posters and photographs showing various foot conditions and corrective exercises.

ABSTRACTS

John S. Coulter, M. D.

The Value of Hyperpyrexia in the Treatment of Bronchial Asthma

Kenneth Phillips, M.D., and S. Shikany, S.B., Miami, Florida, in South. M.J. 28:9:801, September, 1935.

The production of artificial fever by high frequency currents was first reported by Neymann and Osborne in 1929. King and Cocke and several other workers followed in 1930 with their reports dealing with various methods for the raising of body temperatures. The clinical application of electropyrexia was also introduced, and has been further developed by Neymann and Osborne. All of their work along these lines, however, and as a matter of fact the great part of the literature to date dealing with electropyrexia applies almost specifically to general paresis and diseases of the central nervous system.

The treatment of bronchial asthma by electropyrexia was first reported by Feinberg, Osborne and Afremow. Seventeen patients suffering from intractable bronchial asthma who had proven to be refractive to conventional treatment were given artificial fever by diathermy. Two treatments comprised a course, but one case received seven. Their theoretical basis for employing this measure, according to their opening paragraph, was the clinical observation of temporary relief from asthmatic attacks associated with febrile infectious diseases, especially if the infection was outside of the respiratory tract. Their biochemical studies consisted of complete blood counts and the acid-base balance. Their results were favorable and encouraging. They made a further report simultaneously with Miller and Piness and Leopold and Stewart. Their final report of thirty-seven cases has since appeared.

Method of Study

We, therefore, did not select our cases, but chose fifty patients suffering from bronchial asthma in chronological order, regardless of sex, age, type of asthma (acute, chronic, intractable), previous treatment or other associated factors. Every patient was treated with one course of hyperpyrexia which we arbitrarily fixed at ten treatments. Wishing to establish the proper time interval between each treatment, this group was divided into two parts, one sub-group receiving treatments once a week, the other twice a week. No attention whatever was paid to allergic manifestations, since any allergic therapy would veil the results obtained by the electropyrexia. Many of our patients, however, had been previously studied from the allergic standpoint and treated accordingly without benefit. A number of patients suffering from upper respiratory infections and mechanical obstructions, such as enlarged tonsils and adenoids, as well as some patients with sinusitis, were treated for these conditions by the usual methods because the bronchospasm was so constant and severe that it was impossible to treat the patient with electropyrexia until some measure of relief had been attained. The greater number,

however, were only treated with electropyrexia. In order to throw more light on the physiologic changes and to attempt to interpret conflicting reports in the literature, each patient was given a routine examination at the beginning, during and after the first treatment and again after completion of the course. We recorded and observed the following: weight, temperature, pulse, blood count, blood pressure, basal metabolic rate, alveolar carbon dioxide tension, vital capacity and McDonough colloidal bodies. A chemical analysis of the blood, urine and perspiration, including calcium, chlorides, serum bilrubin, nonprotein, nitrogen, urea nitrogen, uric acid, blood, sugar and acid-base balance was also made. Following the complete course the entire group was observed for a period of from three to eight months.

In treating the bronchial asthmatic we believe we can obtain the same results with temperature below 105° F., maintained two to four hours, as with higher temperatures, providing we pay more attention to what appears to be an important factor, namely: a gradual rise of temperature instead of a rapid one. Therefore, we do not have to hospitalize a patient for the sole purpose of treatment, since the treatment period is comparatively short. However, a department properly equipped with beds, technicians, nurses and attendants is a basic requirement, since electropyrexia cannot be said to be a simple office procedure, although the patients need not necessarily be kept overnight.

The actual technic and the types of apparatus most suitable for the production of electropyrexia have been thoroughly described in the current literature by Neymann; Neymann, Feinberg, Markson and Osborne; Osborne and Markson and others.

Blood Counts

We can confirm the results of Feinberg, Osborne and Afremow. The red count increases about 10 per cent during hyperpyrexia and the counts following the entire course show no notable change. The change in the red blood count is therefore only temporary. This is not true of the white count. Here there is an increase in the total number of cells during the individual treatment varying from 4,000 to 20,000. The polymorphonuclears increase 10 to 15 per cent, the eosoniophils decrease 3 to 5 per cent approximately, though sometimes no change is found, while in five cases there was an actual increase of from 2 to 4 per cent. No change in the monocytes was observed.

Following the entire course of ten treatments we still find an actual increase in the total white count.

Blood Sugar

In a study of over 400 cases of bronchial asthma we found a constant tendency toward a low fasting blood sugar in over 80 per cent of the patients. This varied between 57 and 95 mg. per 100 c.c.

Nonprotein, Nitrogen, Urea and Uric Acid

In a recent study of asthmatics we found no changes in the nonprotein nitrogen and uric acid beyond normal limits, but an increase in the blood urea was often observed. We studied the nonprotein nitrogen and blood urea of eighteen adults before, during and after a single treatment. There is a slight increase in the nonprotein nitrogen, but a decrease in the blood urea. This decrease averages about 4 mg. per 100 c.c. Following a course of ten treatments, the urea and nonprotein nitrogen returned to normal levels even in the case of patients showing an increase of the blood urea in the beginning. The decreased urea of the urine before treatment increased to a normal level, following the entire course. The perspiration yielded 24 mg. of urea per 100 c.c.

Acid-base Balance

This phase of the asthmatic syndrome is at present receiving much thought and discussion. Acidosis was considered a part of this syndrome by the majority of workers until Beckman suggested that asthma was a potential alkalosis. The same tests applied before, during and after hyperpyrexia reveal individual fluctuations in both directions. With the exception of four or five, the readings stayed within normal limits and we are inclined to doubt that there is much change.

Blood Calcium

In sixty-five cases, using Collips modification of the Tysdale method, we found that sixty showed a total calcium within normal limits. The diffusible calcium and inorganic phosphorus are often slightly altered. Hyperpyrexia does not produce any significant change.

Urine

One of the constant findings in the asthmatic is the hyperacidity of the urine, when collected and studied by the method of Mitchell. This has been previously reported by us. During hyperpyrexia this acidity drops in most cases.

Perspiration

The amount of perspiration collected during fever averages 24 mg. of urea per 100 c. c.; 23 mg. of sugar; 0.075 per cent of lactic acid according to the method of Strauss; and 33 to 97 mg. of chlorides.

Basal Metabolic Rate

Our results confirm those of Neymann and Osborne and others. The basal metabolism increases 7 per cent for each degree Fahrenheit.

Temperature and Pulse Rates

Attention has already been called to the tendency of asthmatics to run low mouth temperatures. In many, a daily temperature of 97° is found; in some we observed daily temperatures as low as 96° F. Fifty cases were closely observed during the course of treatment in order to ascertain whether sufficient improvement would ensue to raise the metabolism and consequently the daily temperatures to a more normal level. Following the fourth or fifth treatment and at the completion of the course, all patients previously manifesting low temperature had reestablished normal mouth temperatures.

Blood Pressure

The majority of our cases showed a lowered blood pressure in the beginning. A systolic pressure of 86 to 90 mm. was quite usual. Most workers have reported a rise of the systolic blood pressure with a fall in the diastolic as the rule during electropyrexia. In our fifty cases we did not find any regular or significant fluctuations.

Weight

Of the entire series of fifty cases only two showed a loss of weight at the end of the course. All the others either held their original weight or gained, one case as much as eight pounds.

Vital Capacity

The vital capacity is decreased in practically all chronic and intractable asthmatics. It increases as treatment progresses, providing the patient is improving clinically. Undoubtedly this increase is not directly related to hyperprexia.

Three cases were allergic to certain foods and before a reasonable degree of comfort could be secured for the

patient it was necessary to eliminate the allergic foods from the diet.

We wish to emphasize that we do not consider it possible to evaluate any therapeutic procedure applied to bronchial asthma for permanent relief until cases have been observed free from attacks over a period of at least one year. Our observations covering a period of eight months, therefore, must be considered as preliminary. We are still observing this group and we will report again after a further lapse of eighteen months. At the present time our results are as follows: Out of the group of fifty patients, the asthma of three was undoubtedly aggravated by the treatment. In spite of this aggravation they remained with us for the entire course of ten treatments. Seven patients received no relief, but two of these stopped treatment at the end of the second and third treatment, respectively. The remaining forty all received clinical relief in varying degrees. Fifteen appear to have obtained lasting relief. Thirty-two have received clinical relief, but their biochemical and laboratory studies still show them to be potentially in danger and further observation will be necessary to determine whether their improvement is temporary or permanent.

Intermittent Pressure and Suction in the Treatment of Chronic Occlusive Arterial Disease

Edgar V. Allen, M. D., and George E. Brown, M. D., Rochester, Minn.; in J. A. M. A.; 105:25:2029, December 21, 1935.

Experience at the Mayo Clinic

Sixty patients have been treated at the clinic with the passive vascular exercise unit, thirty-two of these over sufficient periods to allow some evaluation of the method. Sixty or eighty millimeters of negative and 20 mm. of positive pressure (four cycles to each minute) were used as a routine procedure. All patients were confined to the hospital and only minimal activity was allowed. Those with gangrene or ulceration received anodynes and alcohol, anesthetics and stimulants to epithelial growth were applied locally, as needed, and foot soaks of saturated boric acid were given. Most of the patients took postural exercises and the feet were kept warm in a cradle or cabinet by heat from carbon filament bulbs. Additional treatment given is indicated in the accompanying tables. In these tables and in the discussion that follows, the terms "ischemic neuritis" and "trophic pain" are used to describe conditions as indicated by Goldsmith and Brown.

Ischemic Neuritis. Seven patients with thrombo-arteriosclerosis obliterans and four with thromboangiitis obliterans were treated at the clinic. In all but two cases pain was relieved during a period of treatment. In these two cases, distress was increased by treatment and could not be tolerated. Of the nine other patients who obtained relief during a period of treatment, three were permanently and completely relieved and four were permanently relieved to a degree of about 50 to 75 per cent. In two cases relief was experienced only during active treatment, but pain returned shortly after the extremity was removed from the glass boot.

Trophic Pain. Six of the twelve patients with thromboangiitis obliterans experienced permanent relief of pain. In three cases pain was increased by treatment and in three cases it was unchanged. Trophic pain was present in five of the seven cases of thrombo-arteriosclerosis obliterans; relief was experienced in three and absent in two of these cases.

Trophic Changes and Gangrene. Of the ten patients with thrombo-angiitis obliterans who could tolerate the method, four had very marked improvement of gangrene or ulcers and six had none.

Intermittent Claudication. Three patients with thromboangiitis obliterans were specifically tested for evidence of improvement of claudication. A standard test was used. The patients walked at the rate of 120 steps a minute until they could not continue. They received, respectively, twenty-six, eighteen and forty-three hours of treatment. No benefit was noted.

Pain Associated with Sudden Arterial Occlusion. Two patients with sudden arterial occlusion were treated on the second and sixth days, respectively, after the onset of the condition. In both cases pain and discoloration of the foot were increased by treatment.

Skin Temperature. Determinations of the temperature of the skin of thirty-five patients were made before and after sixty-eight treatments. The average temperature before threatment was 29 C. (84.2 F.) and the average at the end of the sixty-eight treatments was 31 C. (87.8 F.), a net gain of 2 degrees C. The increase in the temperature of the skin as a result of treatment doubtless would have been larger if temperatures at the beginning of the treatments had been less than 29 C. The significance of these readings of skin temperature is vitiated somewhat by the fact that, while the room temperature varied within normal limits, it was not constant. The duration of the increases in temperature was not definitely determined, but it was less than twenty-four hours.

Comparison of Results of Passive Vascular Exercise with Those of Other Methods

It is well to attempt comparison of results that follow the use of intermittent suction and pressure with those that follow other types of treatment. Increases in surface temperature can be accomplished by the artificial induction of fever, by immersion of the hands in warm water, and by the ingestion of alcohol, theobromine and mecholin. All these methods are simpler than treatment with alternate suction and pressure. One may reason, logically, that unusual benefit will ensue from treatment with alternate suction and pressure, only if the increase in circulation is permanent, since similar increases can be induced temporarily by simpler methods.

Permanent relief of rest pain, if effected, is a distinct attribute of the method. Barker, however, reported that as a result of treatment of thromboangiitis obliterans with typhoid vaccine there was a complete or almost complete relief in 86 per cent of twenty-eight cases in which rest pain was present but in which there were no trophic changes, and in 73 per cent of fifty cases in which rest pain was associated with trophic ulcers. In 65 per cent of forty-six cases of gangrene limited to digits, and in 25 per cent of cases of massive gangrene, pain was likewise relieved by typhoid vaccine. Permanent relief of pain by section of peripheral nerves has been reported by Laskey and Silbert.

The good results reported in sudden arterial occlusion are encouraging, but Denk reported almost equally good results from intravenous injection of a papaverine substitute. In one case observed by Allen and MacLean, papaverine was injected intravenously, with good results. It is well known that about one-half of patients with sudden arterial occlusion recover when very simple methods of treatment are used.

In our experience with about 2,000 cases of thromboangiitis obliterans and thrombo-arteriosclerosis obliter-

ans, healing of indolent ulcers has been observed very commonly without the benefit of passive vascular exercise.

The term "collateral circulation' is frequently used in considering chronic occlusive arterial disease. One gains the impression that the term refers to circulation that occurs through newly developed arteries. One of us has reviewed evidence elsewhere that these are not new arteries in an anatomic sense but only in the physiologic sense. In other words, development of collateral circulation is not a process of initiating new arteries to grow in situ but of causing arteries already present to function at a higher physiologic level. Experimental work has indicated that control of the level of function of collateral arteries is largely if not entirely under control of the sympathetic nervous system. An increase in the temperature of the skin is commonly accepted as the best evidence of an increase in the collateral circulation. Sympathectomy remains, then, the best method of increasing circulation through collateral arteries. When sympathectomy is performed, it increases the blood flow to an extremity to an exceptional degree, a result superior to that following any other procedure if degree and permanence are considered together. However, sympathetic neurectomy is inadvisable when gangrene or large ulcers are present.

COMMENT

Evaluation of the results of treatment in medicine is usually difficult, and it is too optimistic to expect any remarkable unanimity of opinion regarding any therapeutic procedure. One thing appears quite certain: the alternate suction and pressure method of treatment has not produced any results that have not been observed repeatedly as a result of simpler methods. Do good results follow passive vascular exercise more frequently than other methods of treatment We have no answer to this question, and no conclusions can be drawn from reports in medical literature. Do good results follow treatment with intermittent negative and positive pressure in cases in which good results have not or could not reasonably be expected to follow other methods of treatment? Again no definite answer can be given and none is available in medical literature. Our own opinion is that good results ordinarily follow changing environmental pressure treatment in cases in which good results could be expected from other measures, and that when good results do not follow other measures, passive vascular exercise is usually valueless.

SUMMARY AND CONCLUSIONS

The intermittent suction and pressure treatment of chronic occlusive arterial diseases increases the skin temperature temporarily, may relieve the pain of ischemic neuritis and trophic changes, and may induce healing of ulcers. It is not clear that these results are superior to those following other methods of treatment. However, it is our impression that the pain of ischemic neuritis is relieved to a greater degree than is ordinarily observed. As a result of our experiences we believe that passive vascular exercise constitutes some, but as yet poorly defined, contribution to the treatment of vascular disease.

The Cardio-Vascular Responses of Pre-Adolescent Boys to Muscular Activity

Edward C. Schneider and C. B. Crampton (From the Department of Biology, Wesleyan Univ., Middletown, Conn.); in Am. J. Physiol., 114:2:473, Jan. 1, 1936.

Summary

Basal arterial pressures were rather low—98 to 104 mm. Hg. Mid-afternoon pressures were still lower. Among adults these pressures are usually higher in the afternoon than in the morning. The basal pulse rates were more rapid than in adults. During standing the pulse rate took a higher tempo than is common among adults. The change from recumbency to standing accelerated the pulse as much as 20 to 34 beats, while among adults the acceleration ordinarily ranges from 6 to 15 beats.

In changing from the recumbent to the standing posture the diastolic arterial pressure invariably rose more than it does in adults. The pulse pressure was uniformly less than in adults.

Prolonged quiet standing always brought on symptoms of fainting. Noticeable changes were a rapid fall in pulse pressure and an inordinate acceleration of the frequency of the heart beat.

The pulse response to the moderate exercise of stepping upon a chair five times in fifteen seconds was no greater than occurs in men.

When subjected to short periods of work of graded intensity the pre-adolescent failed to show the linear relationship between load of work and pulse rate that occurs among adults. A boy who had just entered pubescence gave a good illustration of this linear relationship.

For all of the pre-adolescents 6,000 ft. lbs. was clearly an overload of work.

The oxygen pulse was uniformly less both during rest and exertion than it is among adults.

During periods of prolonged work the heart frequency response to moderate exertion was not noticeably different from that of men, but with loads of 4,500 to 6,000 ft. lbs. the heart either was slow in reaching a steady state or failed to reach it and the acceleration was excessive.

The only unusual feature of arterial blood pressure responses was a drop in the diastolic pressure during the periods of exertion.

The output of blood by the heart per beat during periods of rest was within the range common to men, but during periods of work it was distinctly less than for men.

The minute volume output of the heart was less among the boys than among men but not proportionately the same as that of the stroke volume. The greater frequency of the heart beat tended to offset the smaller stroke volume.

Low Back Pain Caused by Lumbo-Sacral Abnormalities

Maurice N. Bellerose, M. D., Orthopedic Surgeon, Rutland Hospital, Rutland, Vermont, in N. E. J. of M., 213:4:177, July 25, 1935.

General Treatment

The underlying principle of treatment is relief of symptoms by immobilization. This may be procured by two methods: 1. Conservative; 2. Operative.

Conservative treatment is always used in original, acute and infrequent attacks. If the attack is very painful and disabling, the patient is given complete bedrest for from one to three weeks. It is important that the bed be hard, that is, one which does not sag. Such a bed can be made in the home by placing longitudinal boards between the springs and mattress. The low back is firmly strapped with adhesive tape from mid-sacrum upwards so as to include the lower ribs, care being taken that some of the strips are well anchored to the anterior

borders and crests of the ilia. A small pad beneath the tape pressing over the lumbo-sacral joint sometimes gives added relief. Dry heat may be applied to the part, but in some cases it aggravates the pain. After the muscle spasm and acute tenderness have subsided, massage is indicated.

The patient is then gradually allowed out of bed in a snugly fitting lumbosacral belt of heavy canvas, which has a rhomboid-shaped pad on its skin surface pressing over the lumbosacral joint. The belt should be worn as short a time as possible, the patient leaving it off an increasing length of time daily, until it is no longer needed. One of the most important factors in the convalescent treatment is educational exercises. They increase the flexibility of the spine, strengthen the ligamentous and muscular structures, and help correct any postural defects. These exercises should be done under competent supervision.

In the milder and infrequent attacks of low back pain, strapping followed by massage and exercise are usually all the treatment necessary.

Operative Treatment

In many cases conservative treatment is sufficient, but if pain and disability persist, or recur at short intervals, operative treatment should be resorted to.

The operative procedure, as used at the New York Orthopedic Hospital, is fusion of the fifth lumbar vertebra to the sacrum by the Hibbs method, which has proved to be very satisfactory in relieving symptoms where the conservative measures have failed, because it absolutely immobilizes the lumbosacral joint.

Summary

Congenital anatomical variations in the lumbosacral joint increase the mobility at the expense of stability.

Instability of the lumbosacral joint causes strain upon the supporting soft tissue structures and articular facets.

The most common causes of sciatica are anomalies in the lumbosacral region.

Conservative treatment is based on an attempt to decrease the degree of mobility of the lumbosacral joint and to improve the relationship between the fifth lumbar and the first sacral vertebra. When this fails to give adequate relief from symptoms, the lumbosacral joint may be completely stabilized by the Hibbs spine fusion operation.

Light Therapy and Roentgen Therapy in Tuberculosis

Present Evaluation

Edgar Mayer, M. D., New York, in Jour. A. M. A., 105:20:1599, Nov. 16, 1935.

Light therapy, both natural and artificial, is of definite value in the treatment of some forms of tuberculosis. There is considerable difference of opinion on which regions of the light spectrum are most efficacious, as well as confusion as to the tuberculous conditions that respond best to this treatment.

In the choice of an artificial source of light, one must consider the quantity and quality of the energy emitted by the lamp. A sufficient quantity of radiation must be present which corresponds to the particular parts of the spectrum found most efficient in the disease to be treated. Under different conditions all parts of the light spectrum will yield results if particular conditions demand the wave-lengths that a special source of light emits strongly.

For therapeutic purposes the sun, the mercury vapor arc in quartz and the flaming carbon arc burning cored carbons filled with mixtures of carbon dust and metals have been the chief ones of practical importance.

Pulmonary Tuberculosis

For uncomplicated pulmonary tuberculosis, no clinical evidence is at hand to prove the indication for light therapy. The lack of accurately controlled observations among certain workers makes it necessary to accept their favorable reports most cautiously. Until contrary evidence is at hand, uncomplicated exudative pulmonary tuberculosis is a contra-indication to light therapy; with proliferative or fibrotic pulmonary tuberculosis, which may be accompanied by elevation of temperature, sunlight or artificial lights, if employed at all, should be used cautiously.

In an active febrile pulmonary tuberculosis complicated by active intestinal tuberculosis, mercury quartz irradiations have been regularly used by many for the intestinal complication and not infrequently with favorable effect. In such cases the activity and nature of the pathologic changes of the pulmonary disease have been disregarded. The favorable empiric results thus obtained and the poor results obtained when other treatments have been used justify this as an indicated therapy.

Pleural Tuberculosis

Pleural tuberculosis, dry or serous, especially if it is the initial clinical manifestation, is occasionally aided by light therapy. The acute serous form is not to be irradiated. A tuberculous pleurisy with no obvious pulmonary disease usually responds to ordinary rest and hygienic dietetic treatment; those cases not responding after about a month of such treatment may call for irradiation.

Laryngeal Tuberculosis

Laryngral tuberculosis is practically always secondary to pulmonary tuberculosis, so that the indications for the treatment of the larynx depend on the nature of the disease in the lungs. Here, again, light by itself is not curative but exercises its part only as an adjuvant to the other mainstays of treatment. These, in addition to the enforced rest and hygienic regimen, include local measures to the larynx applied as they are indicated. Such local measures in particular include absolute vocal rest (silence), local medications and sprays, and local application of the galvanic cautery. General light exposures are made to the body, with at times additional laryngeal local exposures. The acute forms of laryngeal tuberculosis, particularly those with oedema, are not indications for light therapy.

Secondary Ulcerative Intestinal Tuberculosis

Secondary ulcerative intestinal tuberculosis is the most frequent complication of pulmonary tuberculosis, occurring in from 50 to 80 per cent of the patients who die of pulmonary tuberculosis, as revealed by autopsies.

Artificial light and solar therapy, as well as a rich vitamin diet, should be used in most cases, as they frequently relieve the symptoms and bring about recovery. When the desired results are not obtained by light therapy, roentgen treatment of the intestinal tract should be carefully given or other additional measures employed.

Peritoneal Tuberculosis

In peritoneal tuberculosis, light therapy always deserves a trial first. The serous exudative type generally responds to light irradiation, both in children and in adults. The dry proliferative form, usually adhesive, is

more refractory. When there have been ulcerations and large caseous lymph nodes, as commonly seen in children, the results are most unsatisfactory. When the disease is of long standing, healing is more difficult than when irradiation is begun a short time after onset.

Genito-Urinary Tuberculosis

If unilateral rental tuberculosis is diagnosed at the very onset of symptoms and when such symptoms are slight, conservative treatment with light therapy has on rare occasions prevented the need of surgical intervention. As a rule, nephrectomy is indicated.

For unilateral progressive renal tuberculosis or bilateral disease in which the more involved kidney is removed, light therapy is to be advised as a postoperative treatment. It may have a favorable action on the genital organs and the remaining kidney and effectively contribute to the healing of a tuberculosis cystitis, whether alone or in association with medical treatment. Light therapy exercises a healing action on the stump of the ureter, which so often shows residual ulceration, resulting in a discharging sinus or a persistent cystitis. It has given excellent results, even with chronic gaping wounds, extensive and deep, and even when covered with ulcerations and tuberculous granulations. The edges of the wound are separated and held apart with broad strips of adhesive plaster to allow the light rays to penetrate the depths and to prevent formation of a closed pocket, which would favor purulent retention as a result of a premature superficial closure. Such extensive wounds may heal with a linear elastic scar and often are hardly visible in the pigmented skin.

Bone and Joint Tuberculosis

In bone and joint tuberculosis, heliotherapy, although not the mainstay of treatment, is always employed in combination with other forms of therapy. Orthopedic measures rest in the open and light form the basis of conservative therapy.

Other Forms of Tuberculosis

Various other forms of tuberculosis indicate light therapy. With the cutaneous tuberculosis, lupus vulgaris responds almost specifically. Scrofuloderma and erythema induratum react less constantly, but very favorably at times. Papulonecrotic tuberculids are resistant. Lupus erythematosus is often aggravated by light. Tuberculous ulcers of the mouth and pharynx, usually secondary to advanced pulmonary or laryngeal tuberculosis or to hematogenous dissemination are most resistant. Electrocoagulation is a more effective therapy.

X-rays are of definite value in most cutaneous tuberculosis due directly or indirectly to the tubercle bacillus and in a few results are spectacular. Those which are amenable to x-rays respond well to suberythema or subintensive and fractional dosage. Suberythema doses of from one half to two thirds of a skin unit, repeated in a month or more, give excellent results in scrofuloderma and disseminated miliary lupus. This method of irradiation, alone or combined with various medical and surgical methods, benefits or cures also lupus vulgaris, sarcoid, erythema induratum, tuberculosis orificialis and tuberculosis verrucosa cutis. The tuberculids and lupus erythematosus temporarily involute under x-rays, but recurrences are not prevented.

Aural and ocular tuberculosis are difficult to affect with light, although corneal ulcers and phlyctenular conjunctivitis have not infrequently healed under local exposures. Roentgen therapy has proved effective with tuberculosis of the cornea and iris, but its dose must be moderate and repeated regularly at intervals of about four weeks. These measures are indicated when tuberculin therapy has failed.

Comminuted Colles' Fractures in Elderly Patients—Methods of Treatment and End Results in Thirty Cases

C. E. Haggart, M. D., Boston, in Journal of A.M.A., 105:22:1753, November 30, 1935.

The treatment of uncomplicated Colles' fracture is now well recognized. While the methods employed by different operators reveal many variations in procedure, the underlying principles are quite similar. However, in comminuted Colles' fracture, especially when occurring in elderly patients, it is believed that the results can be greatly improved, particularly by longer splintage than is usually employed, and also by attention to certain details herein described.

It is my belief that in these comminuted Colles' fractures the best results are secured by maintaining the original position and splint a minimum of from five to seven weeks. In the group 2 cases the average was six weeks. This is directly contrary to my treatment of uncomplicated Colles' fractures in young adults, in which the bandage is cut down in from seven to ten days, with the dorsal "tong" sprung open and early massage instituted. In young people, active motion can be allowed in from ten days to two weeks and all splintage removed in from two to three weeks.

In the fifteen patients classified under group 2, the foregoing plan was carried out, with the result that in each instance the patient secured union of the fragments in the position in which they were placed at the time of reduction. None of these patients had flexion contractures of the muscles of the forearm. All presented a range of motion in the finger joints equal to that present before the fracture, and in six instances this range of motion in the fingers had been appreciably increased. In this connection it is believed that, regardless of the degree of arthritic change already present in the interphalangeal joints, fracture of the radius need not and should not be a factor in further progression of this very disabling arthritis.

The decision was reached to splint these patients an average time of six weeks, following the observation that patients did not develop contractures of the flexor group of muscles of the forearm, and because a dorsal tilt of the articular surface of the radius recurred in patients splinted as long as four and in one instance five weeks.

TREATMENT OF DISABLING, OLD, UNREDUCED COLLES' FRACTURE

The comparatively excellent results obtained in these difficult cases through the simple operation described by Darrach has not been sufficiently recognized. Symptoms are chiefly due to the disturbance in relationship of the distal radio-ulnar joint. A traumatic arthritis develops and with weakness of the wrist causes marked disability. Darrach advises subperiostal resection of the lower 3 or 4 cm. of ulna. The styloid process is not removed.

I have operated on three such patients admitted to the clinic one year, ten months and eight months, respectively, following fracture. The results were most satisfactory.

SUMMARY

Comminuted Colles' fractures are of relatively frequent occurrence in elderly patients. The comminution appears to be due to the presence of brittle avascular bone.

Prompt reduction of the fracture is imperative.

Reduction should be carried out under general anesthesia, trimbrom-ethanol preferred, and then visualized under the fluoroscope.

It is most important that the dorsal tilt of the radial articular surface be corrected and that the normal relationship of the distal radial ulnar joint be reestablished.

There are pronounced advantages of the so-called sugar tong (Simpson) plaster splint.

Because of the tendency to recurrence of the deformity of the distal end of the radius in these elderly patients, owing to delayed bone repair, it is believed that the extremity should be continuously immobilized in the "sugar tong" plaster splint for a minimum of from five to seven weeks. The splint is adjusted as indicated; unless there originally was marked swelling this adjustment does not require removal of the splint.

Flexion contracture of the hand did not occur in the patients treated by this method.

Free finger joint motion is necessary, a range of motion allowed by careful application of the splint. Daily complete arm abduction is of advantage in avoiding limitation of shoulder joint motion.

Nonunion of the ulnar styloid, following fracture, was not a significant cause of symptoms.

With this procedure, followed by intensive massage, heat and active exercise, a good anatomic and a good functional result was obtained in twelve and in ten patients, respectively, in a group of fifteen (group 2) as compared with five good anatomic and six good functional results in a similar group of fifteen patients (group 1) who were splinted an average of three and one-half weeks.

The Hypertonic Wet Dressing—An Experimental Study

Frederic W. Taylor, M. D., Indianapolis, Indiana. in Surg. Gynec. and Obstet., 61:5:623, November, 1935.

The exceptional therapeutic value of the wet dressing, and more particularly the hypertonic wet dressing in the care of infected wounds, is an accepted fact. The constant beneficial results seen clinically have established this principle as among the most valuable in modern medicine. Because of this general acceptance, the controversy as to the exact mode of action of the hypertonic wet dressing has long been forgotten.

The data here recorded are the result of the writer's curiosity to know just how much fluid might be withdrawn from a given wound with a given hypertonic solution. It seemed desirable to ascertain whether the amount withdrawn was sufficient in any way to account for the beneficial results obtained clinically. It also seemed important to learn what effect different hypertonic solutions had upon the rate of diffusion of fluid from the wound. The writer has been unable to find any previous work on this particular phase in the treatment of infections. Because of this it was thought that the following report would be of interest.

EVALUATION

It has been shown that the amount of fluid capable of being withdrawn by a hypertonic solution from one square inch of wound surface is 1.2 to 1.5 cubic centimeters per hour. This amount varies between these figures, regardless of the hypertonicity or nature of the solution. In general, the more concentrated solutions gave the higher figure, but to all practical purposes they were identical. This at least held true for solutions with a hypertonicity between 3 and 23 (2.5 and 20 per cent sodium chloride).

The values are maximal for the animals used. They represent figures for new wounds with vascular muscle bases. In older wounds which had started to granulate and the surfaces of which were partly covered by fibrin, the values varied to a considerable extent in different animals and were found to be lower.

It is pointed out that the fluid withdrawn by a hypertonic solution is water and not serum similar to that seen in burns (E. M. Landis, 1934; K. Taylor, 1916). It contains only the amount of protein material which would normally diffuse from the wound. There is no increment of this caused by the hypertonic solutions. The value of this withdrawal of water from the wound seems to the writer to be a debatable question. For, after the initial dehydration of the surface tissues, the continued outpouring comes from the blood vessels themselves and is directly dependent on the vascularity of the area. Also in all wounds except those exposed to the lower concentrations of magnesium sulphate, the wound tissues continued to absorb enough salt to maintain in themselves quite an edematous state.

It has been stated that an increased flow of water to the surface brings an increased number of phagocytes. This seems probable, but the amount of this increase is still unknown. Also the literature relating to the specific ion action an enzymic action resulting from the use of various solutions is unconvincing.

It should be further pointed out in the light of the foregoing experiments on wet dressings that an effective hypertonic solution reaches only the superficial tissue. That the deeper tissues containing the active infection can not possibly be reached by the salt solution is quite evident.

The Value of Spas and Climatic Resorts in the Treatment of Chronic Diseases

Max Einhorn, New York, in Med. Rec., 142:4:197, Aug. 21, 1935.

Carbonic Acid Gas Baths

The Schott-Nauheim treatment of chronic heart diseases consists in giving the carbonic acid gas baths of the Nauheim springs at graduated strength and measured temperature to the patients. During the baths there is usually a slowing of the pulse, with increased volume and strength. The irregularities of the pulse often disappear, and stay away for quite a while after the bath.

Corwin classifies the mineral spring into the following groups:

The muriated or common salt waters have sodium chloride as their principal ingredient, besides various quantities of many other elements.

Alkaline waters with bicarbonate of sodium predominating.

Sulphur waters with sulphur in the form of sulphides and sulphuretted hydrogen gas, and various minerals.

Calcareous springs containing in the main carbonate of calcium, and sulphate of calcium and of magnesium, sometimes carrying also free carbonic acid gas.

The chalybeate of ferruginous waters containing bicarbonate or protosulphate of iron, often in combination with free carbon dioxide gas and other components.

Simple or indifferent thermal springs, which are feebly mineralized, issuing at temperatures varying from 60 degrees to 120 degrees F., and being as a rule, radioactive.

There is no doubt that carbonated baths, like those of Nauheim or Royat, lower tension, and that the use of waters like those of Contrexville, Carlsbad, and others produces changes in metabolism as evidenced by the chemical composition of the blood and the urinary output.

In a general way there are many favorable factors which help to effect a cure; such as a change of surroundings, good air, a correct diet, freedom from cares and worries of the usual city life, agreeable neighbors or friends, simple life, proper exercises and appropriate pastimes.

(The physician who sends a patient to a spa must make a thorough examination of the patient first, in order to detect the patient's real trouble and to select the right place for him, and second, to exclude malignant disease, for in the latter instance, a patient is always better off in his own surroundings or home. The same can also be applied to very weak persons and to all maladies in the advanced or last stage.)

With regard to the selection of a health resort, the patient's wishes must be complied with, excepting when there are contraindications for that particular spot.

With reference to spas, it is fortunate that the United States of America possess them in great numbers and high efficiency. According to the report of the Saratoga Springs Commission there are in the United States of America 2,717 areas where medicinal springs are found; their number amounts to 8,826.

In describing some of the important spas in the United States I shall sketch briefly the mineral springs of the state of New York first, and add thereupon some of the other states in alphabetical order.

PHYSIOTHERAPY IN THE TREATMENT OF INJURIES IN ORTHOPAEDIC PRACTICE

S. A. S. Malkin, M. B., B. S., F. R. C. S. Ed., Surgeon in Charge, Harlow Wood Orthopaedic Hospital Nottingham; in British M. J., No. 3914, page 57, Jan. 11, 1936.

Success in the treatment of fractures, and indeed, of all injuries, depends to a large extent on continuity of treatment of each individual case. On this matter the B. M. A. report states:

"As a rule, on leaving the ward the patient is referred to a massage department under the charge of a different officer, who has taken no share in the earlier treatment. Union of the fracture is thus the signal for a complete break in the continuity of treatment; those responsible for the initial treatment do not know the end-results of their cases; and those who see the end-results do not know how the cases were treated in the early stages. There is no one individual to follow the case from start to finish and to feel pride or disappointment in the final result."

If continuity of treatment is so essential to success, the question may naturally be asked whether physical therapy can be applied without interfering with this principle. Now it is quite clear that this is possible. There are three obvious methods, any one of which, if adopted, would preserve this principle:

1. The physicaltherapy department should be under the charge of the surgeon responsible for the traumatic surgery of the hospital.

2. The officer in charge of the physicaltherapy department should be a member of the team dealing with all traumatic cases.

3. An appropriate number of masseuses should be detached from the ordinary work of the physicaltherapy department to be responsible to, and under the control of the surgeon in charge of these cases.

By adopting one of these methods that common cause of wasted effort, divided responsibility, would be avoided.

Rehabilitation

It will be remembered that during the war workshops were attached to most military orthopaedic hospitals where men who were not able to return to civilian life could undertake useful and interesting work, thus improving their physical condition and preventing that degeneration of morale which so often accompanies lack of employment. In civilian life, the man who is certified to be fit for light work, and who is engaged in an industry in which it is impossible to provide this, is placed in a very difficult position. For this type of case rehabilitation centers corresponding to the war workshops are urgently needed. They would enable a man to regain his full working capacity as soon as possible, and if they could be established and conducted in conjunction with physicaltherapy departments they would be of great value.

Book Reviews

PRINCIPLES AND PRACTICE OF RECREATIONAL THERAPY FOR THE MENTALLY ILL. By John E. Davis, B. A., M. A., Senior Physical Director, Veterans Administration Facility, Perry Point, Maryland, Fellow of the American Physical Education Association. In collaboration with Dr. William Rush Duntun, Jr., Editor of "Occupational Therapy and Rehabilitation," Instructor in Psychiatry, The Johns Hopkins University. Cloth. Price $3.00. *Pp.* 206. *New York. A. S. Barnes and Co. Inc.,* 1936.

This volume presents the theory and practice of recreational therapy for the mentally ill. It is, we believe, the first treatise on this subject. The authors define recreational therapy for the mentally ill as any free, voluntary and expressive activity; motor, sensory or mental, vitalized by the expensive play spirit, sustained by the deep-rooted pleasurable attitudes and evoked by wholesome emotional release; prescribed by medical authority as an adjuvant in treatment.

The function of this form of therapy in this situation is not upon the physical side, the exclusive education for improvement in muscular skills, coordinations, speed, extent or accuracy of movement nor, from the passive aspect. Recreational therapy has a more extensive contribution than this which can only be attained through the natural and pleasurable social unfolding of the psychotic patient. Its aim is to recreate the spirit through many stimulating and tonic effects of interest inherent in the activities which this therapy provides, to increase the strength of positive volitional responses to social re-orientation and to assist in healthful emotional expression and emotional release which will provide the balance and effective stimulation for constructive effort.

There are chapters on types and disease entities, education and reëducation, interest and effort, classification of activities, tests, formal and informal exercise, aims of the objectives of recreational therapy. The authors have had a large experience in this form of physical therapy. This book is recommended to every physiotherapist.

FOUNDATIONS OF SHORT WAVE THERAPY. Physics and Technics by Wolfgang Holzer, Dr. Ing: Assistant in the Physiological Institute of the University of Vienna; Medical Applications by Eugene Weissenberg, Dr. Med., Medical Superintendent of the Short Wave Section of the University Clinic for Nervous and Mental Diseases in Vienna. Translated by Justina Wilson, F. R. C. P. Edin., D. M. R. E., and Charles M. Dowse, B. Sc., A. M. I. EE Cloth Price 12*s*, 6*d*. *Pp.* 228 *with* 53 *illustrations. London, Hutchinson's Scientific and Technical Publications,* 1935.

The first part of the book, 155 pages, by Dr. Holzer gives an excellent summary of the physical and electrical principles involved in short wave diathermy. There are chapters on the oscillation theory, the action of electrical oscillations, the technics of short wave measurements, and the technics of short wave therapy. This section is the best exposition of the physics of this subject that has appeared.

The medical portion contains a summary of three years' treatment by Dr. Weissenberg. The results quoted are entirely too optimistic. There are case reports on a few patients under each disease classification with no series of control patients.

Certainly some of the statements as "short wave treatment is suitable, even in acute stage, for the treatment of joint inflammations" and "an existing pregnancy is no contraindication for short wave treatment" do not agree with American authors who still regard both of these conditions as contraindications.

This book is of value to those interested in the physics of short wave diathermy, but it cannot be recommended to the physiotherapist desiring to know the uses and contraindications of short wave medical diathermy.

KURZWELLENTHERAPIE. By Dr. Josef Kowarschik, Primararzt und Vorstand des Institutes fur Physikalische Therapie im Krankenhaus der Stadt Wein. Pp. 134. *Paper. Price RM* 9.60. *Vienna, Julius Springer,* 1936.

The first chapters of this monograph are devoted to the physics of high frequency currents. This subject is made clear by the use of simple analogies and line drawings.

In chapter three the technic of application of short wave diathermy is well outlined and illustrated. The author states that as yet no special wave length has been found for specific diseases which agrees with the findings of most investigators. The need for good apparatus is stressed and Kowarschik believes that the wave lengths from twelve to thirty meters are the best for general body treatments. He also emphasizes the use of some absorbent material between the electrodes and the skin to prevent the accumulation of moisture on the skin surface which may cause burns.

The biological action of short wave diathermy is discussed in the fourth chapter. Experiments in vitro are quoted to prove that certain wave lengths have selective heating action. All of the physiological effects given are explainable on the basis of heat generated in the tissues. The author believes that certain wave lengths have a specific effect upon bacteria. There are many statements in this chapter that do not agree with the work done by the Council on Physical Therapy of the American Medical Association.

The last chapter considers the diseases in which short wave diathermy is used. The inadequacy of correct information on this subject is well known, and this chapter does not help. The author is entirely too optimistic of his results.

This book is an interesting contribution as it represents the European ideas on the use of short wave diathermy, and is written by a physician who has studied and written on high frequency currents for many years.

THE HUMAN FOOT, by Dudley J. Morton, M. D., Associate Professor of Anatomy, College of Physicians and Surgeons, Columbia University. Cloth, pp. 244 *with* 100 *illustrations. Price* $3.00; *New York, Columbia University Press,* 1935.

This is a book of unusual character. The first part of the volume gives an insight into the evolutionary background of the human foot. This study helps to evaluate more accurately the characteristics of the normal structure and function of the foot, and to analyze the primary factors of its functional disorders. This author's findings do not agree with the emphasis that has been given to muscular control as the predominating factor in foot balance. Morton made muscle tests upon a class of sixty student nurses showing a range of foot posture from normal to second degree pronation. These tests failed to demonstrate any consistancy in the comparative strengths of the pronator and supinators or in their relation to postural disorder.

Morton also opposes the existence of an anterior transverse metatarsal arch. In his studies of the distribution of body weight through the feet, he devised an instrument to register simultaneously in three separate areas for each foot the amount of pressure contact. The significant fact demonstrated by this machine is that the head of each metatarsal bone shared equally in the support of body weight with the single exception of the first metatarsal which bore a double share. Morton believes that these findings contradict very definitely the widely held concept that a so-called "transverse anterior metatarsal arch" is formed by the heads of these bones, for if such an arch did exist, then the second, third and fourth metatarsals could not have registered any pressure.

The author believes that the principal etiological factors of foot troubles are shortness of the first metatarsal bone, posteriorly located sesamoids, hypermobility of the first metatarsal segment and shortness of the calf muscles. These primary structural factors alone are not sufficient to produce symptomic disorder but their influences must be supplemented by existing causes.

In the examination of feet, the author believes, the x-ray is the best means of diagnosis and of determining the manner and degree of fault in the internal mechanism of the clinical features and the disordered function of the feet.

This book is recommended to physiotherapists as a book giving new concepts of disturbances in the foot's mechanism.

PHYSICAL THERAPY FOR NURSES. By Richard Kovacs, M. D., Clinical Professor and Director of Physical Therapy, Polyclinic Medical School and Hospital, New York; Physician in Charge Physical Therapy City Hospital, New York; Visiting Physical Therapist Manhattan and Harlem Valley State Hospitals and West Side Hospital; Consulting Physical Therapist Mary Immaculate Hospital, Jamaica, New York and Hackensack Hospital, New Jersey. Cloth. Price $2.75. *Pp.* 286 *with* 78 *illustrations. Philadelphia, Lea and Febiger,* 1936.

This volume is a concise presentation of physical therapy—exclusive of x-ray and radium—as a text book in nurses' training schools. Nurses are often required to use some physical measure and are often seriously handicapped because their nurse's training gave only a scant consideration, if any, to physical therapy.

There is an introductory chapter on scope, advantages and basis of physical therapy. This is followed by an excellent chapter on general physics, which explains this difficult subject in terms that are easily understood. There are chapters on heat, sunlight and artificial ultra-violet irradiation, electricity, water and massage. Dr. Madge C. L. McGuinness, Chief of Clinic, Department of Physical Therapy, Vanderbilt Clinic; Director of Physical Therapy, Lenox Hill and Misericordia Hospitals, New York City, has contributed a practical chapter on exercise.

This book can be recommended as a text book on physical therapy for nurses training schools. It can be used with profit by graduate nurses as well for it will enable a nurse to assist a physician in the application of physical measures. It is not a text book on physical therapy for physical therapy technicians but can be used by them when they are required to give courses in physical therapy in schools of nursing.

AN INTRODUCTION TO HUMAN ANATOMY. By Clyde Marshall, M. D., Department of Anatomy, School of Medicine, Yale University, New Haven, Conn.; 385 *pages with* 252 *illustrations,* 14 *of them in colors. Philadelphia and London: W. B. Saunders Co.* 1935. *Cloth,* $2.50 *net.*

Here is a brief elementary text book of human anatomy which can be recommended to every physiotherapist. The author introduces the student to gross anatomy immediately and later to the finer structures as he has found this method pedagogically more satisfactory. Although B.N.A. terminology is employed, the old terminology is also given.

This book has two very outstanding features which set it apart from others in the field. The first is the explanation of the derivation and meaning of the terms of anatomy through the use of footnotes. This is a valuable aid to the beginner's understanding of difficult terminology.

The second feature is the inclusion of observations of practical and general interest on the numerous subjects considered. These appear at intervals throughout the book under the heading "Practical Considerations."

The book is well illustrated and succeeds admirably in its aim of not only teaching anatomy but also showing its relation to other sciences and to everyday application.